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ComputerWeekly

Thursday, March 8, 1984

UNIX
Commercial utilities programs COBOL & C NOW
Mills Associates Ltd
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0600-4811

Trouble strikes Altergo Ireland

by George Black and John Kavanagh

ALTERGO Ireland, subsidiary of the British software house which went into liquidation last year, is in deep trouble again.

It has laid off all 65 of its Dublin workers and expects to call in the official receivers this week.

One of its directors, Frank Thurston, says: "If we haven't got any staff to work with, you can draw your own conclusions about what may happen."

Its managing director, Niall Duggan, is in Kuwait trying to renegotiate its £1¼ million contract with United Arab Shipping Company. This was the major job that Cord Designs of Sussex inherited when it took a 60% stake in Altergo Ireland after the parent company crashed last spring.

The system turned out to be more complicated than expected and ran into costly delays. Cord's management is said to have felt that the financial position of the firm was worse than it had been led to believe at the time of the takeover.

Thurston blames the Irish Industrial Development Authority (IDA) for withholding its support for the venture. The IDA says it had not invested because there were problems about terms of resale of the company. It had put in £290,000 over 10 years.

Altergo Ireland was an export-only concern, but Cord is hoping to set up an offshoot called Ominmark to sell both in Ireland and overseas.

London venture capitalist Innotech, backed by supermarket tycoon David Sainsbury, had a minority stake in Cord Investments the holding company for the group which includes Cord Designs and Altergo Ireland.

Cord is reported to have paid £70,000 to the receivers for its 60% share. The other 40% remains with former Altergo Ltd shareholders.

Cord also took over a £1.8 million contract for Saudia airline involving 22 staff, but this is believed to be unaffected, as it is handled by Cord in England.

Cord Investments board chairman Michael Kaufman was unavailable for comment. His marketing director, Gerald Penney, quit last autumn. Three top managers left Altergo Ireland in May shortly after the takeover: David Joice, Stephen North and Philip Devonport walked out after a row.

BELL . . . "Barriers for entering business are negligible."

Swindlers get 12 years

by John Riley

TWO high-tech swindlers were jailed for a total of 12 years at the Old Bailey last week for trying to rob a City bank of over £3 million.

The fraud was a simple one. Laurence Tomsett, 33, telex operator at the Credit Suisse First Boston Bank in Bishopsgate, who was jailed for five years, sent a bogus telex to switch $8 million from the Morgan Guaranty Trust in New York to his accomplice's Swiss bank account.

He then tried to cover his tracks by destroying all evidence of the bogus message.

He "interfered" with the ITT 6100 computer which interfaces with the telex machine and removed the telex ribbon.

The scheme had been timed for the message to arrive on America's Thanksgiving Day when all the banks were closed and it was impossible for checks to be made.

However, art and gold dealer Colin Howard, aged 51, who had three previous convictions for deception and who was subsequently imprisoned for seven years, aroused suspicions in Geneva when he turned up with a suitcase to collect the cash.

The Genevan Bank alerted the Credit Suisse First Boston Bank in London which checked and, the court was told, soon realised that "skullduggery was afoot". According to a bank spokesman, the plot was quickly traced as Tomsett had not erased the record of the transaction from the computer memory.

During the trial the jury heard evidence from a number of computer experts, who told how Tomsett used his knowledge to try to "beat the system".

Americans meet over export controls

by George Black

US legislators meet this week to thrash out a compromise between hawks and doves over export controls.

They will have to find a middle way between the two bills proposed by the Senate and the House of Representatives.

Meanwhile, a 30-day extension has been granted to the old Export Administration Act, which expired at the end of September and has been kept in force only by emergency presidential powers.

A bill passed by the Senate last week would give the president authority to impose controls on sensitive high-technology trade. The House of Representatives bill passed last October conformed more closely to the wishes of the vociferous European anti-protectionist lobby. Yet neither bill has so far found favour with the White House.

The issue has been the subject of lengthy disagreements between the Commerce Department and the Pentagon, which fears that the Soviet bloc will get hold of computer parts for military use. The House-Senate committee now has to frame a third bill for the president to approve.

A US National Academy of Sciences report recently concluded that the administration had gone "considerably beyond what was recommended" by an earlier inquiry into prevention of technology leakage.

The report says that the Defence Department is pushing ahead with its own efforts to stem the flow without balancing other goals such as technology productivity and freedom of expression.

No cases of damage to national security have been reported, the Academy says, yet the administration wants to introduce a Defence Authorization to restrict access to certain technical data.

COBB . . . "They seemed happy."

Apple gives assurances to Office of Fair Trading

APPLE has given the Office of Fair Trading an assurance that it will not try to maintain resale prices for its computers. It has told its resellers that they can sell at whatever prices they choose.

The case arose from a complaint to the Office of Fair Trading by an Apple dealer that the micro maker had withheld supplies because of discounting. An Office of Fair Trading spokesman says that on investigation it found that Apple was attempting to maintain retail prices. But it now accepts Apple's undertaking to stop doing so.

Apple's UK managing director, Peter Cobb, says the firm has nothing to be embarrassed about.

"The Office of Fair Trading asked us questions and we answered them. I can't say whether they exonerated us or not, but they seemed happy with our assurances.

"We have not altered our dealer agreement as a result."

The Office is also investigating several other complaints of the same kind, including one against Commodore by London retailer Crestmatt. It says Commodore has forbidden discounting on the Vic 64, which Commodore has denied.

Bell says part-time boss can run show

A PART-TIME president is all that is necessary these days to form a microcomputer company, according to Gordon Bell, who will give the second annual British Computer Society Jubilee lecture, sponsored by *Computer Weekly*, next week.

The reason, says Bell, is that while high density semiconductor and magnetic recording products are clearly high technology, systems assembled from these components are clearly not. As a result, the barriers for entering an end-user OEM or system level business with a generic product are negligible.

All that is needed is someone who can buy and assemble the various circuit boards into a multibus backplane, and a programmer to buy and load a version of Unix, and one or two helpers.

The result, he continues, "is surely one of the largest corporate re-evaluations in the history of business. The only barrier to entering the industry as a board, software, or system supplier is having a personal computer capable of generating a business plan."

Bell until recently was vice-president, engineering, for Digital Equipment Corp. While at DEC, he was involved in the design of many of the company's most successful minicomputers. He is now chief technical officer at Encore Computer Corp.

His talk at the BCS/*Computer Weekly* lecture, which will take place on Wednesday, March 14 at the Royal Society in London, will deal with computer evolution.

Further details on the lecture can be obtained from Kate Norman, BCS. Tel: 01-637 0471.

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Skill shortage holds back micros

■ From front page

In the UK has gone to foreign owned factories, with over 60% using them in processes and 20% in products. This compares to 40% and 10% for factories owned by UK groups and 15% and 8% for UK independents.

Product applications are limited to very few industries, particularly engineering, while process applications are more widely but irregularly distributed. The proportion of users is about twice as high in printing and paper as in textiles and clothing.

Introducing microelectronics has only had a marginal effect on unemployment. Compared to 1981 there are now 34,000 fewer jobs in manufacturing, which is equivalent to about 5% of the total decrease in manufacturing jobs in that period. About 69% of UK factories using microelectronics had no change in the number of jobs as a result.

The conception that resistance from trade unions has hindered the application of micros is not borne out by the survey. Only 6% of firms cited trade union or shop floor opposition as the main obstacle to using microelectronics.

Most people (43%) blamed the general economic situation for their failure to get into new technology. Other difficulties were: lack of people with microelectronics expertise (39%); high costs of development (29%); and lack of finance for development (30%).

About 50% of firms were aware of the various government support schemes to encourage the use of microelectronics; in particular nearly 50% had heard of the Department of Trade and Industry's Microelectronics Applications Project (MAP).

Microelectronics in British Industry: The Pattern of Change, by Ian Northcott and Petra Rogers. Available from the Policy Studies Institute, 1-4 Castle Lane, London SW1 6DR, £25.

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ComputerWeekly

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Alvey shows how to solve skills crisis

by George Black

THE Alvey Committee is to lead the way in trying to alleviate the UK's crippling shortage of graduates with computing skills. It has launched a major new scheme, with the backing of GEC, Plessey and Racal, to retrain non-computing graduates, and to teach new skills to existing staff.

A non-profit company will be set up to coordinate the venture. Alvey will put up some money for pump priming, but several million pounds will be needed from industry. Alvey director Brian Oakley hopes that more companies will lend their support to the scheme.

Professor John Spurkes, seconded from the Open University to get the scheme started, began work last week. He is expected to convene a conference of all interested parties in the summer.

Video aids will feature strongly in the scheme, with material covering everything from TOPS-style introductory courses through to "talking heads" lectures on specialist subjects. Bob Kowalski of Imperial College has already agreed to do one on artificial intelligence.

Oakley has been critical of government spending cuts in higher education, which he believes will result in serious computing manpower shortages over the next three years. "It is too late to avert a serious crisis over the next three years now," Oakley says, "but if the government is serious about the sunrise industries, it must do something urgently so we have enough people by the end of the decade."

Trade and Industry Secretary Norman Tebbit said in a paper submitted last week to the National Economic Development Council (NEDO) that the UK lags behind its main industrial competitors in terms of output of trained engineers and technologists, and in terms of job opportunities open to them.

He credits the government with taking "some important steps over the past two or three years to increase the supply of engineers and technologists from universities and polytechnics". But he warned that employers must play a more active role in signalling their needs to the education system and in providing opportunities for those who acquire technological qualifications.

The cut in grants for higher education imposed in 1982 means, however, that the output of computing graduates from universities will start to fall next year, Oakley estimates that computer industry firms alone will need at least 8% more graduates each year on average.

Some big firms are asking for around 50% more computing graduates during 1984, he says.

■ See News Analysis, page 9, and Leader Comment, page 15.

OAKLEY . . . "It is too late to avert a serious crisis."

Leasing firms like the Budget

by Dave Madden

CHANCELLOR of the Exchequer Nigel Lawson may have made himself unpopular with smoking, beer drinking drivers, but his first Budget – which he described as both neutral and reforming – had some bonuses for the computer industry.

A reduction in capital allowances has particularly pleased specialist computer leasing companies. Ashley Mitchell, managing director of United Leasing, says: "We feel reasonably happy. This breaks the stranglehold banks had on the general equipment leasing market, and destroys their competitive edge."

And Mitchell points out that since leasing companies earn a large amount from the residual value of their leases, and much of this will not come through until 1986/7 the reductions in the main rate of corporation tax from 52% to 35% in 1986/7 means that their business is more profitable than they anticipated.

Small high technology companies will take encouragement from a reduction in their corporation tax from the current 38% to 30% in 1985/6 and from the continuation of the Business Expansion Scheme, which was introduced by the previous Chancellor, in 1983. This offers tax incentives for investment in high-risk ventures and has been instrumental in the development of the over-the-counter market in London.

The computer services industry had been looking for a cut in the National Insurance surcharge, the so called jobs tax, and in fact it will be abolished on October 1.

Roger Graham, Computing Services Association council member and managing director of financial systems house BIS, sees it as a Budget to encourage investment in the computer industry.

ACT wins right to make Victor

by John Riley

THE $30 million turnover UK micro firm ACT has all but won in its bid to take over the remnants of the $130 million US micro maker Victor Technologies. Bankrupt Victor now wants to sell the manufacturing and marketing rights outside North America for its Victor 9000/Sirius micro to Birmingham-based ACT, in a deal estimated at around $16 million.

But the deal cannot be signed by Victor, which filed for Chapter 11 protection early in February, for several weeks yet. Details have to be agreed by the US federal bankruptcy court and others.

An ACT spokesman says that under the proposed agreement with Victor, ACT would be free to manufacture Victor personal computers anywhere in the world and would have worldwide distribution rights apart from in the US.

The Victor machine will continue to be sold in the US, but not by ACT, adds marketing manager John Leftwich.

■ Continued on back page

FOSTER . . . Confident.

Germans apply five-year plan

by John Riley

WEST Germany is about to embark on a five year £650 million national programme in information technology. Unlike the Alvey initiative and the European Esprit programmes, which are geared towards fundamental research, the German programme concentrates on applications.

The main areas covered by the programme, which was undergoing approval by the German Cabinet yesterday (Wednesday), are microelectronics, telecommunications and computing.

The German government will contribute DM 500 million (£130 million) a year to the programme, and 80% of that cash will be new money, according to Dr Gerhard Reckel, head of the data processing section of West Germany's Electrical Industry Association (ZVEI).

Reckel says that the funding is divided up in three ways. Government institutions, including the three major information technology research institutes, stand to get 100% grants.

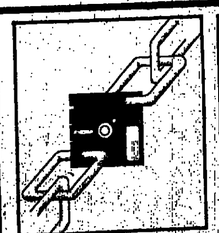
About 90% of the DM 500 million will go to private industry on a 50-50 basis. The rules are that at least two or more companies must collaborate to develop new products to qualify for a 50% grant.

There is also a third scheme by which companies can receive a tax reduction when they carry out applications works in the three areas.

"The Cabinet will finish its discussions this week," predicts Reckel, "and we expect the proposals will be invited this month." He says that the DM 30-40 million which is currently being spent by the government on microelectronics and telecommunications will be incorporated in the programme.

■ The Department of Trade and Industry has spent £574 million on information technology since 1979, including space and Alvey.

Peterborough: England's Silicon Fen? 30-31



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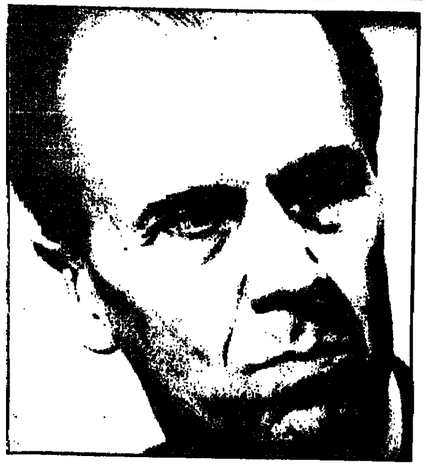

TEBBIT . . . "US strains at every gnat but allows hornets through."

Tebbit urges UK independence

by George Black

TRADE and Industry Secretary of State Norman Tebbit has urged Britain to aim for technological independence of the US, unless the current trade dispute is settled.

He was addressing the North American section of the London Chamber of Commerce last week.

The US practice of extra-territoriality – imposing its own export regulations overseas – had strengthened the argument for a British capability under British control in strategic fields, said Tebbit. He added: "As a second best, Britain should turn to another country with indigenous technology and without pretensions to extra-territorial jurisdiction."

The implication seems to be that if agreement is not reached over exports, Britain should forge closer links with either Europe or Japan, at the expense of the Americans.

Tebbit urged Congress to help reduce tension between the two countries by approving amendments which would curtail their extra-territorial claims in the new Export Administration Bill.

A joint House-Senate bill is to be drafted by a committee mediating between the hawks and doves in the US Congress.

Tebbit stressed that Britain had not gone soft on preventing the flow of high technology to the Eastern Bloc. But he said that there were suspicions that US policy favoured the commercial advantage of US companies rather than the shared strategic objectives of the allies.

The US appeared to be establishing "an edifice of control which strains at every gnat but allows the more dangerous hornets to get through".

He was referring to attempts by US officials to clamp down on the trade in microcomputers.

He said he had been encouraged during his recent visit to Washington to find "very real concern" within the US administration over the spread of protectionism. A civil service team is continuing discussions with the Americans to try to reach an understanding.

Tebbit returns to the US in May with a visit to the West Coast. He will promote export opportunities for UK firms and investment in British industry and is expected to make a trip to Silicon Valley.

■ Academics protest – page 3.

Olivetti puts money in Japan firm

OLIVETTI has made its first venture capital investment in Japan just two months after selling a 25% stake to American Telephone & Telegraph. The Italian maker of office automation equipment is investing £500,000 for 20% of the equity of Dixy, a Japanese maker of displays for terminals and work stations.

See OTC'84 free

ORGANISERS of the first exhibition devoted to the growing Over the Counter (OTC) stock market are offering free admission to the event to *Computer Weekly* readers. London's OTC market is an increasingly significant source of equity finance for small high-risk/high-return companies, and the 1984 OTC Exhibition is aimed at both potential OTC companies and investors. The exhibition will run Friday, March 16, and Saturday March 17, at Glaziers Hall, London Bridge, London SE1. Take along this copy of *Computer Weekly* for free admission. An OTC Conference is running simultaneously: reservations cost £92; details on 01-629 4288.

Computastars

ENTRIES close next Monday (March 19) for the 1984 Computastars contest. Details and entry forms appeared in the February 16 and 23 issues of *Computer Weekly*, and teams wishing to enter one of the four UK heats should contact Gordon Cairns on 01-688 6690 as soon as possible.

Teradyne in UK

US telecommunications manufacturer Teradyne has opened its first overseas factory at Bracknell. It employs 35 people now, and will expand to several hundred by 1986, making microprocessor-controlled test systems. The Boston firm turned over $251 million last year, up from $176 million in 1982, with profits of $21 million.

Tetra sales soar

HIGH WYCOMBE distributor Tetra sold £3.25 million worth of Fortune systems and software during 1983, netting £250,000 profit. Tetra, one of two UK distributors of Fortune equipment, also sells Unix-based Tetraplan financial applications to run on the high-powered US micros. Director Gordon Skinner claims it has been an outstandingly successful year.

Second for Intel

THE acute shortage of microprocessor chips has spurred Intel into a second source agreement for its 80186 with Advanced Micro Devices. Manufacturing data has been transferred; Advanced Micro Devices expects to start production at the end of the year. Demand for the chip, says Intel, will be 10 times that for any previous Intel processor. It can be used to build computers compatible with the IBM-PC.

Academics protest at access to information

by John Riley

TWO eminent academic institutions have expressed concern about the increasing US squeeze on information transfer which is beginning to cause headaches for British researchers.

The Committee of Vice-Chancellors and Principals has written to the British Embassy in Washington and also to UK ministries to outline general fears among British academics that access to information is being restricted.

A spokesman for the Committee of Vice-Chancellors says one of the problems is that non-US nationals have been precluded from certain conferences which can be freely attended by US citizens, on the grounds of security.

The Royal Society has also voiced its worry about restrictions on information transfer.

Dr Ronald Keay, executive secretary of the Royal Society, says: "There are no specific examples, but things have become more difficult over the past 18 months. It is a general worry and our discussions have been on general grounds."

Professor John Ashworth, vice-chancellor of Salford University, but speaking in his capacity as chairman of the National Economic Development Office (NEDO) IT Section, agrees that "there has been a noticeable change in the last 18 months which is extremely worrying for the UK.

"A significant amount of evidence is accumulating but people are reluctant to give specific instances."

The US export laws are wide-ranging and include intellectual knowledge as well as physical machinery or software.

An internal discussion document leaked last year by ICL stated: "If ICL employs an American engineer to write a report or a piece of software, that report or software is controlled under US law – and the end use to which that report or software is also controlled. ICL has in fact had to obtain US export licences to cover knowledge carried in the heads of American engineers."

■ Tebbit speaks out on technology transfer – page 2.

ASHWORTH . . . "Change is extremely worrying for UK."

Stockbroker Greene tips four for the top

by George Black

LOGICA, Rolfe and Nolan, Technology for Business and Miles 33 are the four hot tips for investors from stockbroker Greene & Co.

Its 1983 survey of prospects in the computing services sector published recently picks these four systems houses as chief recommendations for British investors out of 50 organisations investigated.

On Logica, Greene writes: "The high rating is not out of line with that accorded to other specialist software houses. They should not be omitted from any high technology portfolio at current prices."

It adds that the main growth will be in products, not in its traditional areas of consultancy and turnkey projects.

Re-rating of City-based Rolfe and Nolan is long overdue, says Greene. Profits have been held back by substantial expenditure on software development, but this has been fully incurred and written off. From May it will be selling turnkey systems in this country and abroad.

Technology for Business has been overshadowed by trading as a subsidiary of the French firm Logabax. But the brokers feel it is now on a sound financial footing and its dividend yield is one of the highest to be found in the sector.

The company is market leader for solicitors' systems and has enormous growth potential, according to the report.

Miles 33 established itself as field leader in computerised typesetting and the brokers say that it is 18 months to two years ahead of its rivals. The costs of developing the system have been written off, and there has been intense marketing over the past year, particularly in Europe. Marketing will begin in the coming year in the US, the biggest market by far.

Of the 50 firms reviewed, 44 showed positive growth and 20 improved over 25% in the year.

■ A report by Inter Company Comparisons of London lists the fastest-growing UK computer services firms as consultancy Mancos Holdings, Rolfe and Nolan and peripherals vendor Zygal Dynamics. Datastream has the most profitable employees, followed by Rolfe and Nolan. Highest paid staff on most recent data are at Rand Information Services (average £16,325) and BIS (£15,067).

Storage ships in IBM rival

by Keith Holder

STORAGE Technology, the biggest supplier of plug-compatible disc systems in the world, has shipped its first IBM 3380 contender, the 8380, into the UK.

This marks the beginning of a concerted effort by the company to break into the European market for 3380 disc systems, which helped push IBM's peripheral sales to a record figure last year.

Geoff Benjamin, acting managing director of Storage Technology, says: "There is a market in Europe for about 20,000 3380-type disc systems this year, and we are determined to get our fair share."

The race is now on among the plug-compatible manufacturers to grab the biggest slice of this market, with National Advanced Systems (NAS) and Storage Technology both claiming to be ahead at the moment.

Memorex and Amdahl are also contenders in this field, though Amdahl's system will not be released until the end of the second quarter this year. This will be a device made by Fujitsu, which the Japanese company has been selling into its home market, with some success, for several months already.

Benjamin concedes that IBM will remain the biggest supplier by a large margin but adds: "There is enough opportunity for all the plug-compatible suppliers to get a lot of sales from what is left."

The 8380, unlike IBM's system which at present only runs under MVS/XA, will run under most IBM mainframe operating systems. There are two disc control units available with the 8380, a standard controller, the 8880, and a cache memory controller, the 8890. The latter, however, uses older technology, in common with the IBM 3350.

This could be a disadvantage if IBM follows up its announcement of a new model 3380, which will run under the DOS operating system instead of the usual MVS/XA, and discontinues manufacture of its 3350, according to Steve Muxworthy, peripherals products manager for NAS.

NAS, which markets Hitachi's 3380 plug-compatible system, the 7380, plans to introduce a cache controller, utilising current 3380 technology, this summer.

NAS shipped its first system into the UK in June last year, and now has installed a base of 26 units. Storage Technology's first system only went live last month, though Benjamin says: "We are confident that we can maintain our market position this year, and expect shipments in the hundreds."

MPs doubt Registrar's status

by our Parliamentary Correspondent

AMENDMENTS designed to ensure that the Data Protection Registrar will be independent of the government were moved during the Data Protection Bill's committee stage by SDP MP Robert Maclennan.

Maclennan is worried about the power in Schedule 2 of the Bill for the Home Secretary to control the size of the Registrar's budget and staff, set out in Section 2 of the Bill.

David Waddington, minister of state at the Home Office, defended the government's control over the Registrar's manpower and expenses. The Bill already did much to guarantee the Registrar's independence, said Waddington, but it would be irresponsible to give the person too free a rein over public funds.

However, Labour MPs said they were unhappy that the Registrar did not have more powers to investigate complaints by people who suspected that data files concerning themselves were being misused. The MPs wanted the Registrar to take the initiative in investigations.

The Data Protection Bill was also indirectly connected with a question in the Commons put by Michael Meacher, Labour front bench spokesman.

He wanted to know for what purpose a Ministry of Defence installation in Mayfair had been connected to a national network of computers and terminals.

Some of the details of this MIS computer had been revealed by the *New Scientist* recently.

Leon Brittan, the Home Secretary, replied that it had been the practice of successive governments not to comment on the use of computers for national security.

SPL recruits boss from rival Logica

by John Kavanagh

SYSTEMS and software firm SPL International has appointed a new managing director from rival Logica to boost marketing and take it into the US.

Dr Dill Faulkes has come in after 12 years with Logica, recently as head of the US operation. David Thomson, a financial man, has moved up from managing director to chairman and chief executive, and a new financial director, Simon Westbrook, has been brought in from outside the industry.

This reshuffle and change of emphasis follows SPL's most successful year yet. Turnover grew 20% to £12 million. And the company moved from losses into a profit expected to be about £1 million.

Towards the end of the year the Canadian television and radio company Western Broadcasting, which owned 60%, bought the other 40% from the UK government's British Technology Group.

That buy-out, giving SPL strong North American backing, plus Faulkes' appointment, mean the company "will be looking very carefully" at the US, according to Thomson.

"Our parent has made clear its intention to expand SPL," he says. "Faulkes has special responsibility for marketing. We all see it as essential to put a much stronger emphasis on marketing and sales, while working from a firm financial and operational base."

SPL entered the US market late in 1982 through an agent, Intelligent Industrial Systems. It is now looking to expand that business, possibly through a takeover.

The company is already established in Europe through operations in Sweden, the Netherlands and Italy. It has 450 staff.

■ SPL and Tandem Computers, US manufacturer of Non-Stop systems, have signed a contract under Tandem's Alliance programme of third-party marketing agreements. SPL was one of the first firms to enter a third-party deal with Tandem and has done £13 million worth of business on the company's computers since 1980. Tandem has already signed up Logica under an Alliance deal.

THOMPSON . . . Moved up.

It expects to do 25% of its UK business through third parties this year. Last year its UK turnover was £26 million. Worldwide business totalled $420 million.

Survey sees tougher times ahead for many micro firms

by Keith Holder

THE microcomputer market is becoming a tough place to survive – and will get tougher, acording to a market research report by Technology Intelligence.*

It predicts that, as competition hots up, 40% of current suppliers will go bust in the period 1984-88 and one in three micro companies will not survive two years.

It estimates that the UK market for micros will grow by an average 46% a year, and the market will move from being hardware driven to software driven.

These figures are close to an earlier estimate by the Economist Intelligence Unit, which predicted a 52% growth rate and a market value of $2.3 billion by 1987.

The report also says that 70% of today's machines will not be in production by 1986.

National Computing Centre (NCC) spokesman Bill McCool says that he thinks the Technology Intelligence report is close to the mark.

"It highlights the same situation that existed earlier with mainframes," he adds. "Only the number of companies and the scale are much larger for the micro market."

He predicts that the main criteria for sorting out the winners from the losers will be what operating systems are used by a particular machine, and that only 10 or 12 manufacturers will be left by 1988.

Chairman of the British Micro Manufacturers Group, David Broad, agrees, but says although the attrition rate for micro companies will be high, there will be new firms setting up almost at the same rate.

He adds: "The figures given are open to interpretation. We might see the micros of today disappear only because they are replaced with new models."

He points to his own company, Comart, as an example. It now has sales for its most recent 16-bit system exceeding those of its original eight-bit machine, though Broad adds that the older machine has a future.

The report goes on to say that the smaller manufacturers and distributors will be forced to look for specialisations not catered for by large volume manufacturers, like IBM, in order to secure themselves a future.

Broad describes this attitude as "over-simplistic", pointing out that the small business market alone will supply sufficient scope for low volume manufacturers of micros.

He adds: "I don't expect to see any fewer manufacturers in the future than we have now, though they may not be the same companies we see now."

Large corporations may find themselves at a disadvantage in this market, he adds, as they will find it more difficult to respond to the sudden changes the micro market has displayed in the past.

Russ Nathan, managing director of Romtec, thinks the distributors may have the roughest time over the next few years.

He says a directory compiled by Romtec shows that up to one-tenth of the distributors in business at the beginning of the year have folded.

He also warns that companies should not pay too much heed to market growth forecasts, and adds: "People seem to expect the growth to follow a straight line whereas, in reality, it has peaks and troughs."

Nathan thinks the report's conclusion about a software driven market is on target.

He says users are becoming more interested in what software programs will run on a particular machine, and less about the machine itself.

He cites recent experience where manufacturing clients have asked his advice on what software to offer with their new models, prior to launching the machines on the market.

"This is a very healthy trend. Users can see packages perform in their own environments, and it will do much to help the micro penetrate vertical markets," he concludes.

*The Micro Business. An Examination of the UK Home, Personal and Small Business Computer Market 1984-1988. Price £55.

Fujitsu grabs 49% of Amdahl

by Keith Holder

JAPANESE electronics giant Fujitsu has increased its stake in Amdahl, the US plug-compatible manufacturer, to nearly 50%, following its purchase of shares held by venture capitalist Heizer.

The agreement, signed last week, is for Fujitsu to acquire six million shares, worth about $190 million, taking its holding to 49.6%.

The move has opened the floodgates for a wave of speculation about Amdahl's future an an independent manufacturer, although the relationship between the two companies goes back some 10 years.

Such fears are groundless, says Bryan Little, Amdahl UK managing director, the development is designed only to strengthen the companies' relationship, he says.

He adds that an agreement, to be signed soon, will include a declaration by Fujitsu that it will not acquire any more shares in the company, a statement it needed to satisfy the US Securities Exchange Commission (SEC).

The exact share-out of three seats on the board, vacated by Heizer, has not been agreed yet, says Little, but it is expected Amdahl will take two and Fujitsu one.

Fujitsu already has three seats, so this result would give Amdahl an overall majority on the board for the first time in its history – "hardly the position one would expect if we were being taken over" says Little.

A more plausible reason, given by industry watchers, is that Fujitsu, conscious of its vulnerability as a non-American supplier in the US market, wants to position itself to sell its products under the Amdahl name. Its main rival, Hitachi, already does this through its distributor National Advanced Systems.

Fujitsu has already announced plans to build a new plant in the US to avoid anti-Japanese discrimination of its disc products (see page 8).

It is also rumoured that Amdahl is worried by the prospects of IBM's high-powered Sierra mainframe range, expected in November, which would require it to uprate its existing 580 series, or launch a new system, to maintain performance advantage.

The ability to outperform IBM's machines is a crucial factor for plug-compatible manufacturers if they are to compete effectively.

Fujitsu, on the other hand, has been reported as having a new generation of "supercomputers" up its sleeve, which could provide Amdahl with its answer to Sierra.

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US service giant turns to products

by John Kavanagh

A MAJOR reshuffle at the top of US services giant University Computing Company and a $44 million cash injection has confirmed that the $153 million company is moving into applications software products in a big way.

Its new applications products division has been given equal status to the mainstay systems software division. And president Allen Hufft has resigned after 15 years with the company – nine months after takeover specialist Gregory Liemandt joined as chairman.

Meanwhile in Europe the company is considering further takeovers in the microcomputer applications field.

It moved into applications products in the autumn with a $21 million double takeover. First it went for Open Systems, a US firm with accounting packages for eight-bit and 16-bit microcomputers. Then it bought banking software firm Financial Software of America.

These moves followed the arrival of Liemandt from services firm Geisco – which took over several software companies in the early 1980s. He organised a $25 million share issue specifically to fund takeovers. Since the first two deals the main shareholder has put up another $24 million and provided a further $20 million research and development loan.

"We're now evaluating the European opportunities for the micro products," says Mike Cocks, head of Software Products International.

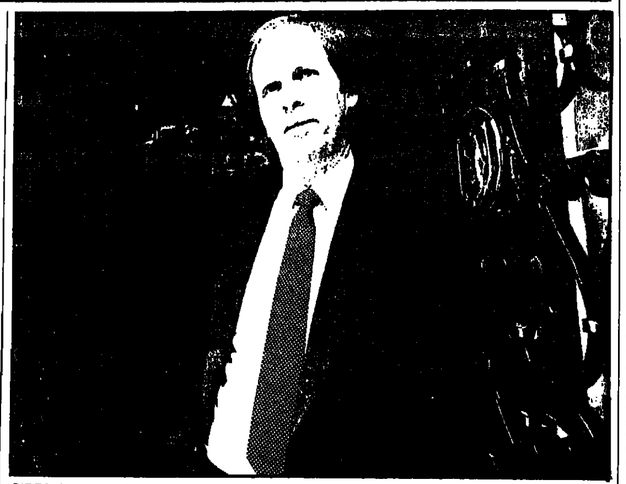
"It could well involve acquisitions of applications companies – and the UK would be the spearhead as it's the fastest-growing market.

"If we go ahead we will expect micro products to make a big contribution, so we'll certainly do it in a big way."

Cocks says that since Open Systems was bought, its annual revenues have grown from $6 million in 1983 to a projected $16 million this year.

Hufft, who was made president a year ago, left amicably, Cocks says. "Greg Liemandt is a very dynamic individual with a very strong personality and his own way of doing things," he says.

■ After a poor end to 1982 and start to 1983 University Computing has reported a profit of $190,000 for the year. It was hit by the generally poor state of the bureau business and by the write-off of its unprofitable hardware OEM side. Fourth quarter profits of $1.2 million show the company recovered in the second half of the year.



O'BRIEN . . . "It is hard to persuade good software people to go into maintenance."

Thorn-EMI forms new arm

by Philip Hunter

ELECTRONICS giant Thorn-EMI last week moved into computer maintenance by setting up a 90 strong firm aimed particularly at the business micro market.

The new company, Thorn-EMI Computeraid Services, will provide third party maintenance of installed micro and minicomputer systems and peripherals, and will also offer a quality control service to manufacturers and importers.

The company has set up in Farnborough, and is headed by Maurice O'Brien, previously general manager of the firm's Software Sciences Hardware Maintenance division. Predicted first year turnover is £2½ million.

O'Brien says that the micro maintenance and service market is potentially vast, and is ready to be opened up by the right sort of marketing.

But one problem facing the new company, says O'Brien, is the difficulty in hiring good software maintenance staff. "It is hard to persuade good software people to go into maintenance," he says.

Computeraid Services has opened engineering workshops in 10 UK cities as a base for a return-to depot service to users, and its "Total Care" service for importers, OEMs and manufacturers.

Computeraid Services is a subsidiary of Thorn-EMI's Information Technology division, which expects to report turnover of £200 million for its year ending this month.

The group moved deeper into the software market by setting up Thorn-EMI Software with 70 people in October 1983 to market financial and systems software.

The company also owns Software Sciences, which is involved in the UK Ada project.

SALES BRIEF

Ferranti's CAM-X rakes it in

FERRANTI is at last making a return on its investment in computer-aided design and manufacturing systems, with orders for its CAM-X system now running at £1 million a month. The company's CAD/CAM arm, Ferranti Cetec Graphics, took five orders in December 1983, including an export order from German engineering group Krauss Maffai for £200,000, and two orders totalling £450,000 from Vickers Defence Systems. The company is expected to announce a multi-million pound CAD/CAM order this week.

DPCE hardware

A HARDWARE maintenance contract worth £250,000 has gone to independent computer maintenance firm DPCE UK. The firm will be responsible for the maintenance of an ICL 2960 mainframe and associated peripherals over the next three years at the Cheltenham premises of Dowty Group Services.

Box office winner

LONDON-based Space Time Systems has won one of the largest contracts for computerised box office systems. The company is to install its Box Office Computer System (Bocs) at all theatre and exhibition venues owned by the City of Birmingham, including the National Exhibition Centre, in a £500,000 contract.

Cray goes to Italy

US supercomputer-maker Cray Research has announced its first order from Italy, and its fourth so far this year. Cineca, a consortium of 13 Italian universities, has ordered a Cray-1 M/2200 worth $6.4 million, to be installed at its data processing centre in Bologna for scientific research.

Stroud changes

STROUD Building Society is changing its equipment from bureau service, run by National Westminster Bank subsidiary Centrefile, to its own in-house system based on an NCR 9300 computer. The Society has ordered a new version of NCR's Building Societies System developed by Quadra Computer Services.

ICL motor deal

ICL is to supply British Telecom's motor transport division with a nationwide processing network costing £2 million. The network, to be developed in the next six months, will include a System 25 mini at each of 10 regional transport offices, and a further 45 System 25s for the largest service centres.

Shipping contract

THORN-EMI subsidiary Software Sciences has taken a £100,000 order for its multi-user Wicat computer as part of an information system containing details of ships, cargo, movements and crew, and suppliers. The system installed will be the Wicat 220, designed by Seatime Data Systems.

Senate stamp

THE Post Office has gone to Senate Computer Services, a subsidiary of the London-based Gordon & Gotch Computer Group, for a £370,000 order entry, processing and accounting system to manage its Philatelic Bureau's worldwide sales to stamp collectors. The system will run on the bureau's new Burroughs B6900 mainframe.

Nixdorf order

NIXDORF Computer, West Germany's biggest indigenous computer maker which recently went public to raise money for an assault on its domestic micro market, has taken an order from Banque Belgo-Zairose for an 8870 mainframe.

Philips thinks the IBM office way

by Donald Kennett

DUTCH electronics giant Philips last week unveiled its strategy for office automation, Sophomation (Synergetic Open Philips Office Automation), and revealed that it has gone firmly into the IBM camp.

The company's plan to combine office automation, networks and information systems is heavily based on IBM's document interchange and document content architecture as a method to adhere to the International Standards Organisation's Open System Interconnection standard.

The terminal which Philips hopes will become the packhorse of the system, the P3100 which was announced last week, is compatible with the IBM-PC.

Gert Bindels, Philips data systems division managing director, says the IBM micro will become de facto standard for office automation within two years. Philips' version was developed outside the Dutch conglomerate by a company Philips refuses to name, but is probably Corona Data Systems with its IBM-PC lookalike.

Philips will manufacture the workstation and will carry out its own further development. The company will aim its initial sales at its traditional banking market and intends to move on from there to tackle other financial markets such as insurance.

"It is an important part of our office automation strategy to make it easier for the customer to adapt to the Sophomation system," Bindels says.

Key elements of the Sophomation scheme are the document handling devices, the networking systems, together with the software applications and tools. The Memphis software generator is claimed to increase programmer productivity by 50% to 70%.

Many of the parts of Sophomation, such as the Sophonet and Sopholan wide-area and local networks, and the Megadoc multimedia document storage system launched last year, can be used as independent systems.

Two joint ventures are being set up with Control Data to develop and make mass storage drives and their media. A third joint venture with another unnamed partner will produce a low-cost multi-colour impact printer that will, according to Bindels, beat even the Japanese.

"You can have a 1½in disc that can hold as much as a floppy," he says, "but it will take years to get it reliable. We don't expect it to be in mass production before the 1990s."

■ Philips last week announced a 49% increase in net profits for the year, to 647 million guilders (£147 million), on sales that had increased by 7% to 46.2 billion guilders (£10.5 billion).

BINDELS . . . "We don't expect mass production before 1990."

Half of VDU women had abnormal pregnancies

by John Riley

A STUDY of VDUs by the US National Association of Working Women reveals that over half of the 873 respondents suffer from eyestrain, exhaustion and muscle pain. The study also claims that over half of the 48 women using VDUs in a San Francisco airline reservation office who had become pregnant since 1979 had abnormal confinements.

The association, called 9 to 5, produced a report which has received wide coverage in the US computer press. The newspaper *Computerworld* says the sample of 48 pregnancies in San Francisco is small and that the defects could have been due to other factors, including nearby radioactive wastes.

In the UK, eyestrain and aches and pains are usually due to poor attention to ergonomic factors in the office and to minor correctable defects in vision, not noticed in a non-VDU environment, rather than to emissions from the machines themselves.

NatSemi pays $1.75m for fooling Pentagon

by Keith Holder

NATIONAL SEMICONDUCTOR (NatSemi) has admitted that it deceived the US government over reliability testing of components destined for military and aerospace use.

The admission followed a Grand Jury investigation and the filing of a 40-count indictment charging the company with falsifying test certificates.

NatSemi has agreed to pay $1.75 million in damages and legal costs, and the US government case against it has been dropped.

The charges centred around components supplied between 1978 and mid-1981. NatSemi was disqualified as a supplier of military components for a short period in 1982, but company president Charles Sporck adds that since that time the company has added 32 products to the Department of Defence approved list and is one of only three suppliers to have its products certified for use in space.

Sporck says that after the test irregularities were discovered, NatSemi applied strict controls to ensure all tests were carried out.

A spokesman for the Northern California district attorney says the relatively small fine was the result of extensive plea bargaining. But according to Sporck, the fact that the government did not find any instance of failure in the field of under-tested devices was the crucial point.

The company recently announced that Hewlett-Packard, which has reportedly criticised the quality of US semiconductors, has decided there is no further need to test NatSemi bipolar logic chips on delivery.

CAP signs Far East software deal

by Philip Hunter

APPLIED Communications, a US producer of software for electronic transfer of money, is to distribute its products in the Far East through a company half-owned by UK software house CAP.

The distribution agreement with Sime CAP of Singapore will make products available in the financial markets of Hong Kong, and elsewhere in the Far East.

The companies do not at present plan a tie-up in Europe. "Any UK involvement will be on general policy rather than technical," says Malcolm Nell, Applied's UK marketing director.

His biggest UK success to date was in 1982 with a contract to supply the Scottish Trustee Savings Bank with software to control its automatic teller machine (ATM) network controlled by Tandem hardware. The company has also supplied a system to handle point-of-sale authorisation to Eurocard, based in Frankfurt.

But a disappointment for the company was the recent decision of the building societies not to go ahead with a shared ATM network. It was to supply the switching equipment for this contract.

The US firm, until recently supplied software only for Tandem's fault-tolerant hardware.

Tandon lays off half its US workers

by Keith Holder

THE lure of cheap manufacturing in the Far East has led US disc drive manufacturer Tandon to lay off half its US workforce and transfer manufacturing to its subsidiaries in India and Singapore.

And the company may also build a manufacturing plant in this country.

A spokesman for the company says the loss of around 1,400 workers in California will be compensated for by a massive recruitment drive at the new manufacturing facilities.

Sirjang Tandon, company president, says every effort was made to maintain production in California, but the price demands of the marketplace made this impossible to achieve.

The move will not affect workers in Europe and the UK, says a spokesman, who hints that Tandon is considering the UK as a possible new site for a manufacturing plant.

The move to the Far East will make the company better able to compete, and will benefit customers by offering more competitive prices, he adds.

Production at the new sites, some on a contract basis, is expected to start quickly.

There will be no shortage of products because of the move, the spokesman says.

Trans-Basic prize goes to Wiltshire

A SMALL Wiltshire software company has carried away the first prize in a competition for those who think they can program efficiently in a multi-user environment.

The winner, Panoramic Computing of Chippenham, is an one-year old start-up company. David Warren, managing director of Panoramic, used the application generator from the FMS80 relational database management system to write his entry. FMS80 was developed by David Rodman.

Computer Automation put up the money for the competition, which challenged programmers and systems analysts to beat a simple transaction programming exercise running in a multi-user environment. The Computer Automation example was based on its own Trans-Basic language.

There were 150 entries in the contest, but Panoramic's entry was a clear winner. Warren said that winning the competition was a "wonderful vote of confidence for us and FMS80. Every software house and independent programmer reckons they have the best program, and this was their chance to prove it".

Peter Yellow (centre) of Computer Automation presents the cheque to Warren.

Panoramic recieved £1,000 for the lowest entry, and an additional £500 for beating Computer Automation's own score. *Computer Weekly*, which backed the competition, will present £500 to the Royal Marsden Hospital, Sutton, as part of the contest.

Second place went to Deborah Evelyn of Tandem Computers, using Enable, followed by M. Radcliffe of Merit Software (Pilot, on a System 10), S. Campbell of NRS (RPGII), Peter Hay of IBM UK (RPGII), and D. J. B. Jones of P-Cam Systems Ltd (RPGII).

Micro makers resist efforts to curb adverts

by Keith Holder

EXTRAVAGANT advertising claims made by computer companies should be curbed, and a new watchdog body set up to see that this happens, according to Peter Sinclair, managing director of Sinclair Consultants.

But the computer industry, including micro makers such as the (unrelated) Sinclair Research, has been quick to pour cold water on the idea.

"The small business systems industry is too often characterised by overselling and under performing," says consultant Peter Sinclair.

He suggests that instead of the present Advertising Standards Authority (ASA), there should be an independent body, under the guidance of the National Computing Centre (NCC), to keep a closer eye on the claims made by manufacturers for their products.

The NCC, however, does not agree. Director David Fairbairn says: "We don't see that a watchdog committee is necessary. The advertising authority, in matters of high technology advertising, should take advice from informed sources."

The ASA says that it does take advice on these matters, though a spokesman declined to name the sources it uses.

"Computer manufacturers are not our number one area of complaints anyway," he comments, "and we are satisfied that we are covering the area adequately."

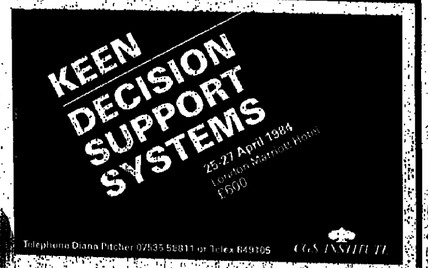
Sinclair also points to the small "home" computer manufacturers as the most frequent transgressors of the advertising laws, describing their advertising as "too often resplendant with absurd hyperbole and unjustifiable superlatives".

Manufacturers do not agree, and think that Sinclair is being unfair.

A spokesman for Acorn Computers, which makes the BBC Micro, says that any complaint brought by the ASA has been taken very seriously, and remedied immediately.

These companies are adamant that they do not attempt to mislead.

Eric Wilton, who handles Acorn's advertising campaigns and says: "Companies in the home computer market are selling a product that is way ahead of the customers who are buying these machines. Some translation is necessary and there are a few slips made between the brain and the mouth."



Users turn to touch screens

by John Riley

THERE is an "explosive" growth in the demand for touch sensitive terminals, says the boss of Mellordata, the UK manufacturer of off-the-shelf touch systems.

Geoffrey Mellor, managing director, says that the UK is now catching up with the US in user awareness of touch sensitive screens and that his sales of touch sensitive terminals have increased 20 times over the past year, particularly in the past few months.

Colchester-based Mellordata, which distributes terminals and printers, designs and manufactures touch systems for terminals and is shortly to announce a touch system for several makes of terminal, including US manufacturer Televideo's Personal Terminal.

"The main demand is from process control organisations," explains Mellor, "such as large chemical companies; power-station control and military command and control systems. Other interesting growth areas are public access systems, information retrieval systems and training."

Mellor says that several large orders are in the pipeline from training colleges: "Students can interact with a touch terminal more easily than by using a keyboard.

Touch terminals are also good for multiple simulation systems, for example, control panel training, where the user can put up different simulated control panels on the screen at the flick of a switch.

"We've been preaching the touch screen gospel for some time now," says Mellor, "and now we feel that it is bearing fruit."

Prime buries axe and takes on staff

by Andrew Thomas and Claire Gooding

PRIME is recruiting CAD/CAM specialists at its Stevenage plant – almost a year to the day after 38 staff were axed there. Prime took over the Compeda CAD software house late in 1982 after a long period of uncertainty during which a further 20 employees quit.

A deal with Computervision, the world's largest CAD company, has given Prime a version of the Medusa solid modelling package for an undisclosed sum.

Until now the rights to Medusa have been split between Computervision subsidiary Cambridge Interactive Systems in Europe, with Prime selling in the US and the remainder of the world.

Now both companies share the worldwide rights, giving Prime the right to enter Europe, where Computervision has already sold more than 300 systems.

After June 1, Medusa is likely to develop along two separate paths as Prime and Cambridge, the product's developer, add enhancements. Prime plans to integrate Medusa into its own complete CAD/CAM system, and is now looking for up to 14 people "very urgently" says a company spokeswoman.

The 14 will fill vacancies left at Stevenage by last year's redundancies and resignations.

Medusa runs mainly on Prime kit, but according to Cambridge chairman John Chilvers, a DEC Vax version has been around for three years and until now has been kept under wraps on his orders.

"We weren't hiding it, we just weren't pushing it at all," says Chilvers. "But now we've got worldwide rights, there will be a change of emphasis."

The version of the package bought by Prime, version 4.6, is the current issue, but the US mini-maker will not get any of the enhancements Cambridge plans for the next six months.

"From now on, Prime will not get any new modules or enhancements; it will have to provide its own," confirms Tom Sancha, managing director. "At present we're not worried about having to compete with Prime in Europe, especially as we are free to sell worldwide. We're now back in full control of our own product, which puts us in a very strong position."

Prime, thought to be behind target with its Medusa sales so far, seems to have paid dearly for a product which Sancha implies will soon be outdated.

But apart from gaining its European foothold Prime will now be released from the vulnerable position of having its premier CAD-CAM system supplied by a competitor. It will now be free to build the product into its own long-term plans to create an integrated CAD/CAM environment.

CHILVERS . . . "We weren't hiding it, we just weren't pushing it."

Go-ahead for Alvey executive workstation

TWO parallel schemes to build high-performance executive workstations have been put in motion by the Alvey directorate.

Both involve GEC, ICL and Ferranti and the longer-term scheme will also incorporate Thorn-EMI, Plessey and STC.

The first has been given the go-ahead for a £60,000 pilot study into a new machine that could be launched in 18 months to two years.

The longer-term idea is to develop a common architecture for all UK manufacturers of computers and their components. This is likely to take at least three years to accomplish and will probably involve many more firms than the present consortium of six.

Alvey director David Thomas, who is responsible for the intelligent knowledge-based systems aspect of the five-year programme, is about to announce another major plan involving a consortium of big firms in image processing. And another initiative in VLSI is close to launch.

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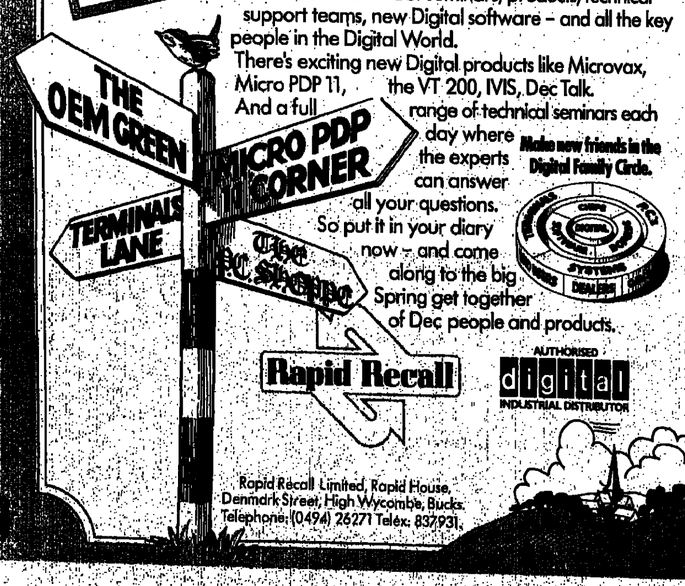

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Mercury denies rigged Whitehall comms deal

by Nuala Moran

MERCURY Communications, the private telecommunications company, has strongly denied allegations that the government planned to provide it with guaranteed contracts for re-equipping Whitehall's communications network.

The charge was made last week by Colin Talbot of the telecomms engineers' union, the POEU. Speaking at a conference on privatising BT he said the government was rigging tendering for its own networks in order to boost Mercury.

But Mercury says this is untrue. "The guy who made the statement was playing at politics," according to Sandy Skinner, Mercury marketing communications manager.

"If any public authority goes out to tender as of now we expect to be asked to tender. We would be very cross if anything went to BT on a single tender basis, but we do not expect to be offered business on a plate."

A POEU spokeswoman says: "We have suspected all along that this might happen and that the government would make sure Mercury got some contracts. Talbot appeared very satisfied with his sources when he made the speech and the POEU is now trying to find out exactly what the position is.

"And Mercury need not necessarily be in a position to know if it was being favoured."

Meanwhile cable laying for Mercury's figure of eight optical fibre network is "going like a bomb", says Skinner. The cable is being laid in troughs along railway lines.

The threat of work on the network being blacked by the National Union of Railwaymen came to nothing earlier this month when its executive sent a memo to members saying it had decided to co-operate on the network.

Mercury has established one communications link – a microwave link between London and Birmingham.

Skinner says he expects the first customers to start using the service "very shortly".

Ericsson takes bigger share of phone market

by Donald Kennett

ERICSSON, the Swedish telecommunications and electronics group, increased both sales and profits by 30% last year, despite heavy investment and losses in the US.

Sales totalled 25.24 billion Swedish krone ($3.3 billion) and profits before tax and appropriations Skr 1.76 billion ($232 million).

Investment in the US went on the development of new products and on the expansion of its distribution network, but Honeywell shared the development costs following the co-operation agreement between the two companies.

Losses in the US were largely in the cable division, but were reduced by 40% on the previous year.

The company's share of the public telephone exchange market continued to rise because of the success of its AXE digital system, which had been ordered by 49 countries by the end of the year.

Sales of its cellular mobile radiotelephone equipment tripled during the year, and it won important contracts in the UK and the US.

The number of staff employed rose from 66,300 to 70,783.

Ericsson Information Systems, the office systems part of the Ericsson group, plans to add 100 new staff to its UK complement of 230 this year.

UK managing director John Bunce says the company has grown at an average of 51% a year since it was set up in 1981, and more staff are needed for sales and customer support to sustain and improve on this rate of growth.

Last year's sales reached £17.4 million and the main growth areas were electronic typewriters and Alfaskop video workstations. But the company introduced several new products to the UK last year, including the Eritex 10 teletex terminal, the Step/One microcomputer and the 4544 high-resolution colour graphics printer.

This year it plans to launch its Eripass access control system, a range of modems and a range of word processing attachments for electronic typewriters.

Bunce adds that a major factor in his company's progress is the merger with Facit, whose office furniture has enabled the company to supply "absolutely everything" for office, warehouse and factory management systems.

UK firm goes on US takeover trail

by John Kavanagh

UK SYSTEMS house Systems Designers International is on the acquisition path in the US to expand its fledgling business there and to back its planned move into the software products market.

This emerged last week when the company announced annual results, which showed it had maintained its 45% profit growth for the fifth year running. Profit before tax was up 46% at £1.55 million. Turnover rose 47% to £13.95 million.

The share price has risen to almost £6 from £2.10 when the company joined the Stock Exchange at the end of 1982.

"Over the next three to five years we'll be looking for more profits from products," says chairman, Philip Swinstead, who formed the company in 1969.

"The US is the biggest products market, so it's most important for us to get in there. We're looking very seriously at acquisition prospects: we're talking to software firms and to merchant bankers that can find good companies for us."

Last year the US operation increased its business by four times to $1 million and broke even. There are 20 staff.

"It's a nice little base, but if we are to break into the market it must be much bigger," says Swinstead.

Systems Designers' main business has always been building customised systems. Government contracts, especially defence orders, account for 45% of its business. Swinstead says many elements from these contracts can be packaged as standard software products.

It has built secure office automation networks for government users. Swinstead says 1985 will see the launch of a standard secure network product by the company.

"We will still supply big systems, but some of the components could be packages," he says.

Other products include the Ada programming language, which is being launched in Europe, and the Poplog expert systems language. In 1983 products accounted for just over £1 million of the total £13.95 million.

During 1983 Systems Designers increased its professional staff by over 40% to 425. There are also 100 sales and administration people.

Sales outside the UK totalled £2.9 million, compared with £2.1 million in 1983. Significant overseas business included a £1.5 million software contract from Olivetti to develop a public viewdata system for the South African Post Office.

In the UK the Perspective project control product became the first software system to win the British Computer Society's technical award.

SWINSTEAD . . . "We'll be looking for more profits from products."

French switch funds

by Jack Gee

FRANCE'S socialist government has opted to channel funds into the computer and electronic industries instead of into doomed state-controlled sectors such as steel and coal, which are to be treated less generously.

Computer maker Bull and electronics giant Thomson will each receive one billion francs (£80 million) this year as part of the effort to achieve the ambitious targets of France's five-year electronics plan. The plan, which runs until 1986, seeks to make France independent of foreign sources for computers and semiconductors by the end of the current decade.

But the funds set aside for Bull are only half the FFr500 million (£40 million) allotted by the Exchequer in 1983. Thomson got FFr550 million (£44 million) last year.

On top of the financial aid which Bull's chairman, Jacques Stern, will get under this issue of cash, will be a sum for research and development.

The French computer industry will also benefit from FFr700 million (£56 million) which are being channelled this year into Thomson Telecommunications. This is a state-managed company which was set up at the end of last year to pool the efforts of Thomson and CIT-Alcatel in developing digital telephone switching systems.

STERN . . . Can be confident.

The title Thomson Telecommunications is misleading, because the weight of management and technology in the new company comes from CIT-Alcatel, an offshoot of Compagnie Générale D'Electricité, one of the few nationalised firms in France showing a profit.

Thomson's finances are in a parlous state, although it has handed over its computer activities to Bull and its loss-making telecommunications division to the joint venture with CIT-Alcatel.

French President François Mitterrand will be keeping a particularly watchful eye on the performance of the nationalised companies.

The companies' chairmen, appointed two years ago after the companies were nationalised, are to be judged at the beginning of 1985. Those who have shown signs of turning round failing groups – such as Bull's Jacques Stern – can be confident of holding on to their jobs. Others, like Thomson's Alain Gomez, who still have a lot of ground to make up, might be discarded.

Tiny micro is in offing

by Keith Holder

A NOTEBOOK-sized microcomputer, which will run programs written for the IBM Personal Computer, is about to hit the US market.

California-based Kaypro, a micro dealer that already markets a range of business machines, is on the point of finalising a deal with the Japanese trading group, Mitsui, to distribute the machine.

Details of the machine are still shrouded in secrecy, but industry sources say that the computer can closely imitate the IBM-PC when plugged into its base station, which contains a screen and floppy disc drives.

Once separated, the micro uses a large internal temporary memory to store programs such as word processing, spreadsheet and financial modelling packages.

In this mode it is not completely IBM-compatible, because the computer's flat screen cannot handle some of the graphics.

The screen can display 16 lines of 80 characters, four times as much as the Tandy Model 100, which is about the same size.

Software compatibility is said to include the ability to run Microsoft's flight simulator and Lotus's 1-2-3.

The machine was developed by Mitsui in the US, and Kazuhiko Nishi, from Microsoft.

A spokesman for Kaypro says that the preliminary agreement with Mitsui will be made permanent next month, and will result in Kaypro having an exclusive licence to sell the machine.

No price has been agreed yet.

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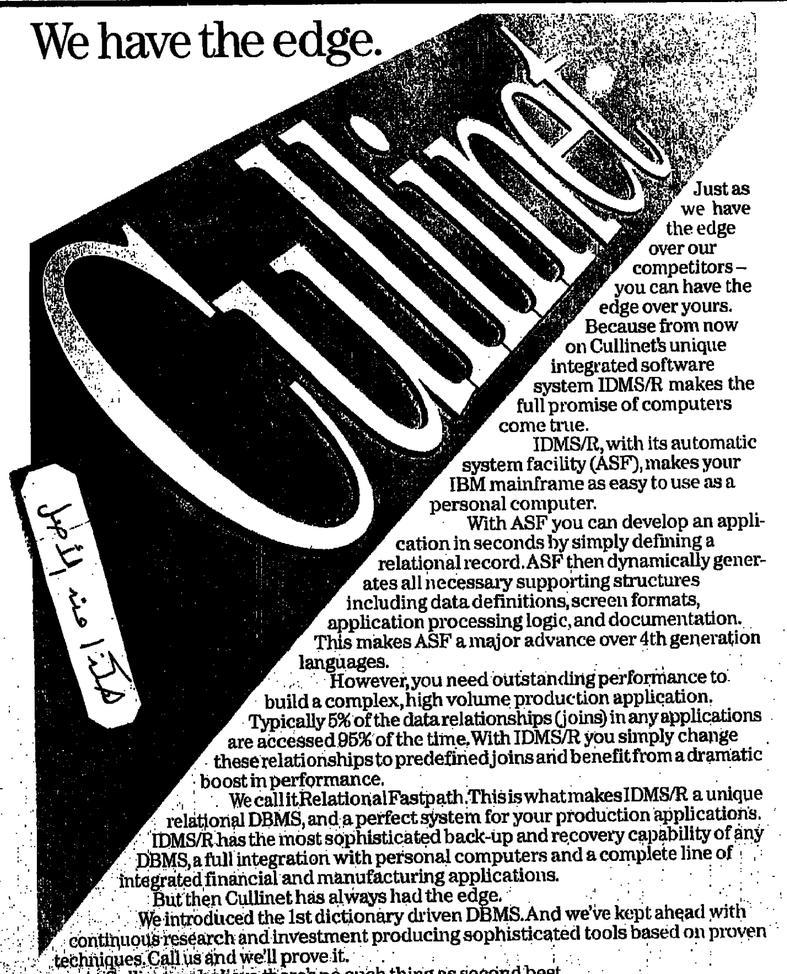

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Sinclair seals Korean deal

by Nuala Moran

SINCLAIR Research is expanding its markets in the Far East by way of a deal with Samsung Electronics of South Korea. The deal licenses Samsung for local assembly and distribution.

The deal covers the ZX81 and Spectrum. Sinclair will ship out the components and it is expected that the first machines will be on sale in South Korea later this year.

A Sinclair spokesman says: "There is no published or quotable figure on what this deal is worth. But we are confident that there is significant potential, and obviously Samsung is too. Samsung is an enormous company with a great deal of strength, so it has all its distribution worked out.

"This sort of local assembly deal is the only way to get into this market," he adds. This is because of high import duties on finished goods.

There are no plans on the software front. "Software was not a subject addressed in any detail in this deal," says the spokesman.

He confirms that there is no possibility of Samsung assembling and selling the Quantum Leap (QL).

The deal involves only the South Korean market, and there are no plans for Samsung to sell anywhere else. The deal will not affect Sinclair's Chinese venture, which in any case is hardly off the ground.

The company made an agreement last September with the South China Computer Company and the China Electronics Import and Export Corporation to do trial assembly of the ZX81 and Spectrum with a view to assembling and marketing the machines in China.

CHUNG . . . Signs with Sinclair.

The Sinclair spokesman says: "They didn't get the first product for trial assembly until the end of December and so they haven't completed their evaluation yet. We're waiting to hear from them what their level of interest is."

Earlier this month, Sinclair announced plans to "drastically enhance" its sales outside the UK and US, including the licensing of companies in South America, Africa and Asia to build its products, and developing the French and German markets.

Samsung Electronics manufacturers consumer and industrial electronics. It had an export turnover of US $500 in 1983.

NEC attacks OEM disc market

by Keith Holder

FLOPPY and Winchester discs from Japanese manufacturer NEC will hit the OEM market this month.

Mike Jeffrey, disc product manager for NEC's European business systems division, says that the move is designed to secure a large slice of the non-captive OEM demand for disc products. He estimates that the growth in demand for 5¼inch Winchester discs alone is around 60% per year.

NEC's initial introductions will be 5¼ inch and eight inch Winchester, plus eight inch floppy discs with maximum capacities of 20, 167 and 1.6 Mbytes.

A European distribution network is being set up and Thame Systems has already signed up to supply eight inch Winchesters.

From April, samples of a slimline 5¼ inch floppy disc and a nine inch, 520 Mbyte Winchester disc will be available.

Jeffrey says that two of the discs fit into a standard 19-inch rack, offering a compact unit with over one gigabyte of storage. Later in the year the company plans to introduce a 3½ inch floppy disc.

Jeffrey says that the discs will be marketed in earnest from April, but adds: "We are not going to flood the European market."

He says that he expects a slow growth initially, but hopes to build up support with a solid user base.

There are no plans to introduce the company's optical disc system before the end of this year, he adds, and it is unlikely that NEC will set up any manufacturing facilities in Europe for the time being.

DUGGAN . . . "Purely commercial decision."

Receiver tries to save Altergo

by George Black

ALTERGO Ireland has been put into the hands of the receivers, who face the difficult task of reviving its major contract with the United Arab Shipping Company.

Cord Investment, which held 80% of shares in the company, has appointed William Horgan of accountancy firm Arthur Andersen as receiver to sort out its financial affairs. Cord managing director Niall Duggan says that it has lost over £100,000 and has decided not to invest any more in Altergo.

Less than a year ago Cord took a 60% stake in the Dublin subsidiary of Altergo when the parent company went into liquidation. Since then, it has increased its share to 80%, the rest of the stock remaining with other former Altergo shareholders.

Horgan says it is too early to say what can be rescued from the situation as his staff is still gathering information. He hopes to have assessed the picture by the end of this week.

United Arab Shipping Company will not comment on the collapse of its £1.4 million contract to supply a new system, saying the matter was in the hands of lawyers. It is extremely doubtful whether the job can be finished now that the 65 Dublin staff involved have been laid off.

Duggan claims that the original contract with the Shipping Company had been re-negotiated when Cord took over Altergo Ireland and the completion date of summer 1984 had been taken out.

He says this means that the Shipping Company cannot claim for damages. He adds that it is obliged by the contract to supply staff for testing the new system at certain times, which he alleges has not happened.

Because the testing has not been done, the Shipping Company has fallen behind with its monthly payments to Cord, Duggan says it has been unable to complete the work unless it raised more capital.

"It didn't even try to do this, it was a purely commercial decision," he says. But he believes that if the money had been there the system could have been finished in August.

One ex-employee, however, who would not be named, says: "When the redundancies were announced there was nearly a riot because people felt the operation had been so badly mismanaged. It had some problems before the takeover, but it has been 10 times worse since."

Duggan met the Kuwaiti managers in November to alter the timetable, but it slipped again.

Altergo's other big scheme, for Saudia airline, is going smoothly and will be finished by June, according to Duggan. But the 20 people on the project will need to be re-allocated somewhere.

Fujitsu discs venture out of Japan into US

by Keith Holder

JAPANESE electronics giant Fujitsu has announced that it will start producing its high capacity memory disc in the US. This will be the first time the company has produced discs outside Japan.

A spokesman says that the move would "strengthen the company's overseas strategy", but admits that it is also a way around discrimination by US companies of foreign products.

He says that the company hopes to start production this year, but no formal timetable exists yet.

The plant in Santa Clara, California, will be on the same site that Fujitsu manufactures business systems components.

The plant will also be ideally sited for one of its biggest customers, Amdahl, which uses Fujitsu disc systems in its own product range.

A spokesman for Amdahl says that there have been no discussions with its Japanese partner on this point, but he did not rule out the possibility that discs from the new plant would be used.

Silicon Express is to be the first UK distributor for Fujitsu's 5¼ inch Winchester disc drives. Units are already in stock and will be supported by the company.

Directronics sets up Australian viewdata

by Donald Kennett

DIRECTRONICS Australia has bought $2.5 million worth of Sperry 1100 series mainframes and DCP8 (distributed communications processors) to set up the country's first nationwide public viewdata service.

The service will be based on the UK's Prestel standards and will be upgraded to support the CEPT European standard later.

This week, the UK's National Computing Centre teamed up with Langton Information Systems and Telecom Australia, to present a series of seminars in Melbourne and Sydney on Prestel's public and private facilities, with case studies of viewdata in finance, industry, government and leisure.

The first machine for Directronics' service is due to be installed in Perth, Western Australia, in May, and others are to go to Melbourne, Sydney, Adelaide and Brisbane during this year. The company has also negotiated to take information from overseas viewdata systems.

Directronics has run successful trials for its service using public viewdata kiosks in shopping centres to supply sponsored retailing information, news and weather reports.

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NEWS ANALYSIS

Recruitment and training are vital issues that refuse to be solved easily. George Black reports on a House of Lords inquiry into recruitment and Philip Hunter examines the limited success of a government training scheme

Fight the modern fight, DoTI told

The House of Lords Select Committee on Science and Technology is inquiring into recruitment problems through a series of public hearings. Last week it interrogated Sir Ieuan Maddock and the past principal of Manchester Polytechnic Sir Alex Smith. At a previous meeting it took evidence from Alvey Programme director Brian Oakley. George Black reports.

A NUMBER of higher education establishments should be nominated as national institutes of industrial technology and be funded through the Department of Trade and Industry instead of the Department of Education.

This is the main recommendation of a written paper presented to the Lords inquiry into new technologies by Sir Ieuan Maddock, Maddock, former government chief scientist, is now deputy chairman, international, of the US General Electric.

He proposes that the level of funding should be deliberately made more attractive both in terms of student grants and in support for equipment and postgraduate studies at these centres. They should be allocated a higher proportion of visiting professors, lecturers and other facilities from the best reaches of industry.

Strong emphasis should be put on marketing and international trade methods, opportunities and constraints.

The level of funding provided by the Department of Education and Science should not only be reduced correspondingly, but by an even greater proportion. In its place should be direct funding by industry at both secondary and tertiary level.

Industry should be encouraged – coerced even – into providing money through powerful tax inducements. Where public money is used, it should be committed to educating the high quality staff industry needed.

It is ridiculous, according to Maddock, to witness giants of the electronics industry whose business is largely with government, bemoaning the fact that they are starved of technical personnel.

The number of mid-career specialist training or re-orientation courses should be boosted, following the example of Cranfield Institute of Technology. Again, there should be powerful inducements to industry to detach its rising stars from their workbenches, machines and offices for further

"We are fighting a dire economic war, but I think we can do it"

training. Civil industry has much to learn from the armed forces in this respect, he goes on.

Maddock hopes that with the authority of the House of Lords a dramatic attack could be made on this vital question.

The inquiry had already heard from senior officials of the Departments of Education and Science, and Trade and Industry. It will also take evidence from the Manpower Services Commission and the Science and Engineering Research Council, among others. It is expected to publish its findings by August.

Explaining his recommendations, Maddock told the inquiry that he had begun from the premise that Britain depended upon manufacturing industry and this in turn depended upon the quality of people.

From now on, we will depend far more on human intellect to add value than on our natural resources such as oil or coal, he said.

"You could run Monaco on tertiary industries such as services, but not the UK," he commented. "Either we make the great leap forward, or we become a country dependent on hand-knitted Fair Isle sweaters. As you cannot do that with a country of more than five million population, we don't have any choice."

Japan, Taiwan and South Korea have all set themselves the same goal. Britain should now mobilise its labour force for the coming war for electronics markets, as it did in 1939 for the Second World War.

One third of Taiwanese schoolchildren, a terrifying figure, are now coming out qualified in electronics, he said.

"We are fighting a dire economic war, but I think we can do it."

He blamed the present shortage of staff for high technology on the flow of the brightest young people into social science, which he admitted he is cynical about. It was fundamentally a social problem that not enough bright people had been attracted into engineering. For some reason, it was regarded as a specialism, whereas to study Pekinese was regarded as a general education.

Draconian measures were now needed to correct this. A series of secretaries of state had tried and failed.

"I'm not suggesting to the government that we should spend more money, only that we should spend it better. We should shift it away from the elitism of science towards industrial technology."

It needs the University Grants Committee list of priorities to be turned upside down, he said. There would be much opposition, but this must be accepted.

Committee member Lord Swann voiced his concern about what Maddock was proposing.

"There is enormous inertia in university research and still more in university teaching," claimed Swann.

"The university system has given rise to a whole range of middle-class closed shops. We may be in danger of setting up a new establishment here. Shouldn't the initiative come from those firms that need the people?"

He suggested that firms should be more ready to take people from other disciplines and re-train them, as biologists had been re-trained for radar work during the war.

Maddock agreed there had been a great outpouring of talent in the early part of the war, unlocked by the emergency. People were far more multi-disciplinary than they believed themselves, he said. The head of IBM's Hursley research laboratory was an Oxford classicist.

The problem was that, although money was going into research and development, the matter of staffing had been left entirely to evolution.

Sir Alex Smith, past principal of Manchester Polytechnic and past chairman of the Schools Council argued that industry ought to be taught as a subject in schools. It was just as important in people's lives as literature or music. But he had failed to win CBI support for this view.

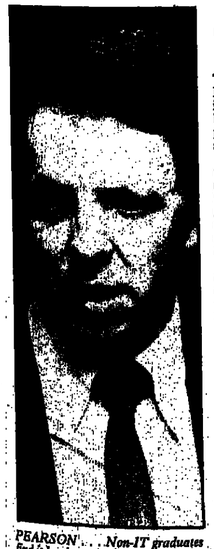
Swann said the most important thing of all was to get schools to understand why manufacturing industry mattered.

Lord Gregson, chairing the meeting, asked Sir Alex whether it was possible to make the great leap forward without adopting an elitist approach.

Sir Alex replied that it was no good having a splendid elite without support from underneath. West Germany had two-thirds of its non-graduate population with qualifications, while the UK had only one third. And Japan is training 11 times as many engineers as Britain.

MADDOCK . . . "Ridiculous to witness industry giants bemoaning the shortage of technical personnel."

Cash boost fails to draw fresh blood



PEARSON . . . Non-IT graduates find it hard.

"Those studying IT from a technical first degree have been most in demand"

THE government's £100 million Information Technology Initiative is having only limited success in bringing new blood into the computer industry to stem the skill shortage.

One of the chief aims of the three-year programme, which was announced by Sir Keith Joseph in December 1982, is to expand postgraduate conversion courses aimed at people with first degrees in subjects not related to information technology.

But students who completed these conversion courses at UK universities and polytechnics in the summer of 1983 have found it hard to finds jobs in microelectronics and computing.

A report just published by the Institute of Manpower Studies" suggests that employers will only take on students who have taken an information technology conversion course as a last resort, and that employers prefer either people with several years' experience in the industry, or graduates in computing, microelectronics or other subjects directly related to their job.

"Those studying IT from a technical first degree have been most in demand by employers," says Richard Pearson, associate director of IMS. "Arts and social science students converting to IT have had more difficulty in finding employment but, even so, have been better placed on the job market than the non-IT graduate."

As well as conversion courses, the IT programme supports specialist courses for graduates in computer science, microelectronics or other IT-related subjects.

Students from these courses have been successful in finding work.

Most of the students from the conversion course have also found work now, but the difficulty they have had is that the government has expanded the total number of places available under the IT programme from 200 in 1982/1983 to 1,000 this year.

Many of the employers surveyed by the Institute welcomed initiatives that increased the number of people with IT skills, but said they would have few vacancies for conversion students.

However, some employers said that students with a first degree in an IT-related subject in addition to a specialist IT qualification were attractive propositions.

But many employers say that their demand is mainly either for good first degree graduates in electronics or computer science, or for people with several years' relevance experience.

Most employers as yet seem to doubt that the government's IT advanced courses, especially the conversion ones, will convert raw graduates into the experienced engineers and software specialists.

While present demand is greater for experienced people than for trainee graduates, training schemes like the government's Advanced IT programme are the only hope of reducing the skill shortage.

The survey also reveals that the IT programme has only had limited success in attracting arts and business graduates into the industry. Only 8% of the 105 students in the survey sample had an arts degree, and business graduates only accounted for 13%.

The majority (about two thirds) had taken first degrees in a scientific or technology subject. Many of the courses for the 1983/1984 academic year are heavily oversubscribed. Most applications came from male university graduates. Many women were effectively barred from some of the courses which were restricted to science and engineering graduates, who are predominantly male.

But one of the subsidiary aims of the scheme is to encourage more women into the industry through the conversion courses.

* *Manpower for Information Technology*, IMS report No. 83, 29, University of Sussex, Falmer, Brighton BN1 9RF. Tel: (0273) 686751.

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MICROELECTRONICS

More factories take the plunge

Microelectronics in UK industry is the subject of a recent survey. Philip Hunter examines the results

MICROELECTRONICS is being introduced into UK factories but more slowly than in the US and Japan, with rate of implementation hindered by a shortage of skilled engineers and software specialists.

That is the conclusion of a report* on the use of microelectronics in British industry. About 34,000 jobs have been lost in the last two years as a direct consequence of microelectronics being installed in factories, with 6,000 compulsory redundancies, according to the survey, published by the Policy Studies Institute (PSI).

But at the same time, demand for engineers with expertise in microelectronics has soared, and the present total of 46,000 is at least 21,000 fewer than industry needs.

So in theory at least, most, if not all the school leavers who have been denied jobs by the introduction of microelectronics, could find work with the same companies if they trained as engineers.

Most of the training effort so far, however, seems to have been concentrated on existing staff.

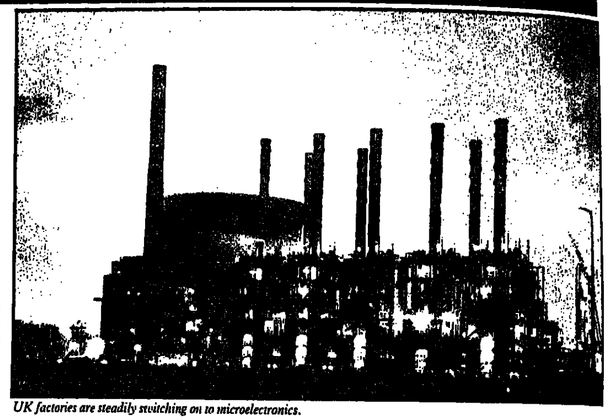
About 30,000 engineers were sent by UK manufacturing firms on training courses in the last two years, compared with about 18,000 in the two years 1979 to 1981. Given the shortage, it is worrying that over a third of the factories say that they still rely mainly on recruiting from outside to get their engineers.

Almost half say they rely mainly on training existing staff to obtain engineers, but about half expected to send no one on training courses in the next two years.

This might make sense from the point of view of these individual firms, most of which also say they do not need any more engineers anyway. But it does not make sense from the point of view of industry as a whole.

It could be argued that the shortage of engineers is only temporary, caused by the proliferation in use of micros, and that the gap between supply and demand will diminish when most factories have already got their new technology. Certainly the number of engineers with expertise in microelectronics has risen sharply in the last two years – from 20,000 in 1981 to 46,000 in 1983.

And despite the shortage of skilled staff, factories are steadily switching on to microelectronics.



UK factories are steadily switching on to microelectronics.

Of the 1,200 factories in the survey sample, 17% say that they use microelectronics in their products, and 61% in their production processes in 1983. This compares with 10% in products and 39% in production for 1981.

Partly because of the shortage of engineers, a quarter of the factories in the survey that use microelectronics say that they do not have a single trained engineer on their staff, and rely entirely on support from the supplier of the microprocessor equipment.

Half of the UK's factories now use microelectronics, or plan to soon. Of these only 6% say that opposition from the shop floor or unions have hindered the introduction of the new technology.

Therefore, the survey can be said to have shattered two popular myths: that new technology is opposed by unions, and that it destroys jobs.

Although 34,000 net jobs seem to have been lost as a result of microelectronics being brought into UK factories, this figure does not take account of jobs created in the firms making the microprocessor equipment. Nor does it reflect jobs saved indirectly through more efficient production resulting from the new technology.

Many firms have so far avoided job losses through the introduction of microelectronics. Two thirds of the firms in the survey say that there had been no significant change in numbers employed because of it, although there may have been redundancies for other reasons.

More than two firms in five in the survey cite the general economic situation, sometimes a euphemism for lethargy or ignorance, as the major obstacle to the use of microelectronics in their factories.

More specifically, 14% say that problems with software is the main difficulty, and 10% blame problems with sensors. Both of these reasons point indirectly to the one central difficulty, the shortage of skilled staff, which bedevils the computer industry as a whole. Problems with the chips themselves seem less important, with only 7% of the firms in the survey putting them top of the list of difficulties.

Microelectronics suppliers can also take heart from the fact that half the firms that have taken the plunge into new technology say that they have found the benefits greater than expected, while only one in 14 has been disappointed.

However, there is less reassurance for the industry in the reasons given by some firms for believing that they have no scope for using microelectronics.

High cost of development is given as the main obstacle by 33% of firms that have so far shunned microelectronics, and plan to continue to do so. Many firms say they have never looked into the possibility, not knowing what is available nor how it could be applied.

Another common excuse is that microelectronics would be inappropriate because too many different types of product are made in the factory or because the firm specialises in custom applications.

Many firms look outside for technical help with implementing microelectronics. The most common source of external help are the suppliers of the equipment, with 73% of the firms in the survey seeking their support.

But the government's Microprocessor Application Project (MAP) scheme is having an increasing impact, with 70% of the firms in the survey now aware of it, compared with 50% in 1981.

MAP was set up in 1978 to increase awareness of the potential for using microelectronics in industry, and to help with implementation. Grants of up to £3,000 are available for feasibility studies, and up to a third of development costs can be recouped from the government.

More recently the Support for Innovation scheme has been introduced to unite earlier government schemes and provide similar support in new fields, such as computer-aided design and manufacturing (CAD/CAM) and robotics.

In addition there is the Joint Appraisal Scheme to help firms raise private capital by using the government's appraisal as a reference.

As many as 81% of firms in the survey say they would like to receive details of support available under MAP and other government schemes – more than say they are or will soon be using microelectronics.

The survey shatters two popular myths: that new technology is opposed by unions, and that it destroys jobs

And 21% of the firms say they have applied for MAP grants, while 15% say they have already received them.

The proportions are higher for firms using microelectronics in their products (28% applying and 18% getting) than for those using only microelectronics in their processes (18% and 13%).

One criticism of the MAP scheme is confirmed by the survey. Although the scheme is aimed mainly at small and medium firms, it has more often been the larger ones that have had projects accepted for grant aid. Presumably this is because large firms are better able to put together viable proposals.

However, the survey also reveals strong support for the MAP scheme. Four firms out of five say that they think the £3,000 grant toward the cost of a consultant's feasibility study is a good way to encourage use of microelectronics.

Most government schemes are lucky to have the approval of half of the potential benefactors.

Although two firms in three say they use microelectronics in either their products or processes, not all use it to the same extent. No account was taken in the survey of whether the applications are already in operation or still under development, and whether microelectronics is used in many processes or products or only in a few.

So the figures inevitably distort the truth, but they certainly give a fair indication of what is going on.

* Microelectronics in British Industry: The Pattern of Change, Policy Studies Institute, £25.

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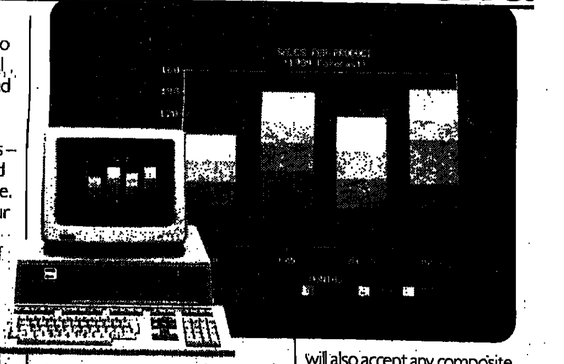

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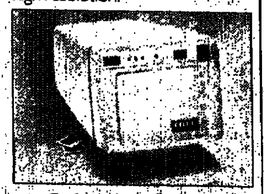

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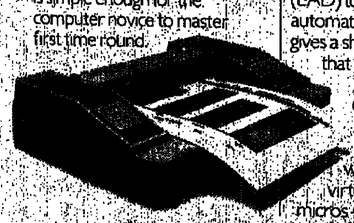

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COMPANY NEWS

Japanese fund invests in UK daisy maker

by Donald Kennett

NIPPON Investment Finance, NIF, the two-year-old venture capital subsidiary of Japan's second largest brokerage house, has chosen London-based daisy-wheel maker ABL Computer Technologies for its first investment in Europe. At the end of February, it bought 10,000 shares – 1.2% of the total – in ABL for £80,000.

NIF supervisory board auditor Misohiko Sono says his company has no further plans for investments in the UK, but it wants to go into other countries including France, West Germany, Switzerland and the US.

The company has holdings in 65 Japanese high technology companies in computers, semiconductors and biotechnology, he says.

It has invested in one undisclosed US company and ABL is only its second investment outside Japan.

The deal is believed to be the first in Europe by any Japanese venture capital company.

Sono believes ABL's earnings will increase considerably as the word processing market develops.

ABL managing director Ian Cole is similarly bullish about his company's prospects.

Last year's sales were $10 million and this was a 100% increase on the previous year. Cole expects a better than 50% increase this year.

Backroom firm aims for double

by Donald Kennett

SHEFFIELD-BASED Data Memories aims to more than double its staff to 100 by the end of 1984 following the best year in its history.

To prepare for this healthy growth, it has invested £500,000 in sophisticated test and formatting equipment for the disc packs it makes; has organised a cash injection of £400,000 from private investors; and bought the Bristol-based minicomputer distributor Wilkes Computing from its parent, the stationery company James Wilkes.

For those wondering why they have never heard of this little powerhouse that can spend £1 million acquiring a company whose turnover, at £1 million last year, matches its own, one reason is that the name is new.

But even the old name, YB Computer Services, has not been thrust before the widest audience, since its business is the backroom activity of taking coated platters and other components from chemical engineering companies and turning them into formatted disc packs for hardware manufacturers to sell with their disc drives.

Managing director Steve Hinchliffe is secretive about who he sells his disc packs to because, he says, these companies sell them under their own names and would be sensitive about revealing where they came from.

"The big boys, the Memorexes and the 3Ms, have pulled out of this game," he says, "leaving more room for the independents. Even BASF shut down its US plant last year."

Only Nashua, BASF and CDC manufacture their own disc packs, he says, and there are only three European independents: Grundy, his own company and Norman Magnetics.

The new expensive equipment Data Memories has bought enables it to servo-write, test and format disc packs for 11 different drives. And it is the breadth of this range that Hinchliffe believes will fuel the company's growth.

"Before, we only built non-servo-written products, and this is regarded as low technology in the industry," he says.

The rationale for acquiring Wilkes, which sells Wicat 68000 – and Unix-based minis and DEC-compatible peripherals, is that Data Memories wants to cover a wider range of computer industry activities.

"We aim to go for a full (Stock Exchange) quote in about three years," Hinchliffe says. "And that's just one company we've looked at to get us to the right size. The hardware side, which is what we've bought, probably fits better into our group than theirs. And we're looking at two other companies we might buy this year."

By the end of this year Hinchliffe expects to see a turnover of £4 million by the Data Memories group.

Wilkes will continue to trade under the same name, and the name YB Computer Services will be used for new activities. This compares with £1 million each for the two companies last year.

HINCHLIFFE . . . "The big boys have pulled out of this game."

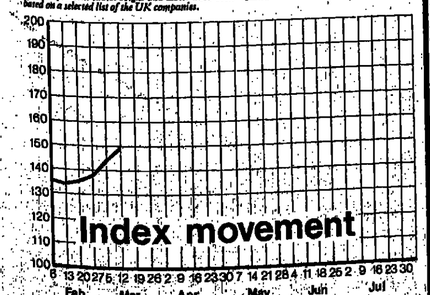
SHARES TABLE

The shares table, which is specially compiled for Computer Weekly, shows selected computer companies that reflect the state of the computer industry.

Previous published Index 143.88 18/3/84 — Index 149.61 — Change +5.78

London Stock Exchange						US Stock			
Pence			Pence		$			$	
1984					1984				
High	Low	Stock	Price	C'nge	High	Low	Stock	Price	C'nge
330	262	Abingworth (10p)	297		20¼	16	Amdahl	19½	– ¼
618	468	ACT (Ops Com) (25p)	570	– 30	38¾	31½	Apple	31½	– 1¼
478	415	Atlantic Comp. (10p)	478	–	32¼	27½	Auto Data Pro	31½	– 1¼
76	66	B. Boy Kent (20p)	76	–	5¼	4½	Automatic	5¼	– ¼
171	142	Chalk (50p)	168		11½	9½	Comp Automation	10½	– ¼
184	118	Cole Group (25p)	184	– 16	21	13½	Comp Sciences	8	
516	412	CASE (20p)	516	– 12½	34½	27½	Computervision	34½	– 1¼
398	266	DPCE (8p)	398	– 32	26	18	Control Data	29½	– 1¼
295	200	Datastevens (6p)	295	–	19¾	13¾	Cray Research	29½	– 1¼
630	580	De La Rue (25p)	630		48	39½	Data General	23¼	– 1¼
438	433	Fidel (25p)	433		29	20½	Datapoint	21½	– 1¼
712	632	Parkmill (50p)	712		54½	42½	Digital Equip	59½	– 1¼
196	176	GEC (5p)	187	– 1	14½	12½	Gen Data Sys	13½	– ¼
73	51	ICL (25p)	73	– 1	13½	10½	Gen Automation	13½	– ¼
47	39	Kalamazoo (10p)	47	– 1	3½	2½	Gould	3½	– ¼
288	240	Kode Int (20p)	288	– 36	26¾	20½	Harris	26½	– 1¼
260	200	Logica (10p)	260	– 32	24½	15½	Hewlett-Packard	34½	– 1¼
203	171	Micro Fed (10p)	203	– 12	16½	11½	Honeywell	34½	– 1¼
58	41	Microtest (10p)	58	– 1	4½	3½	Intel	10½	– ¼
241	204	Micro Int (10p)	204		17½	13½	IBM	124	– 1¼
2721	2500	Mineral Res (50 000)	2500	– 50	205½	181½	Comm Ind.	10½	– ¼
1880	1600	Norcros Ord	1600	–	147½	120½	MDB (Midwest) (2)	10½	– ¼
1350	1000	Office & Elect (25p)	1350	– 81	124½	91½	MDB (Migrant Bd)	10½	– ¼
534	500	Phillips Lamp (71 1p)	534	– 5	49½	37½	Magnetic Assist	20½	– ¼
43	30	Ransay (25p)	43	– 5	3¾	2¾	Memorex	20½	– ¼
318	30	Quest Auto (10p)	318	– 8	29½	22½	Motorola	10½	– 1¼
318	248	Racal Elect (25p)	318		135½	107½	National Semi	10½	– ¼
276	248	Star Comp (10p)	260		19¾	14½	NCR	10½	– ¼
308	239	Systems Res (10p)	308	– 48	138½	107½	Perkin-Elmer	20½	– ¼
308	239	Telemetrix (5p)	308	– 16	20	15½	Prime	17½	– ¼
317	260	Thorn EMI (25p)	317	– 16	24½	19½	Raytheon	34½	– ¼
132	130	UCKT (50p)	130		47½	38½	Rockwell Collins	20½	– ¼
132	300	United Leasing (20p)	700	– 13	13½	9½	Sperry	20½	– ¼
					98½	26¼	Sperry Corp	20½	– ¼
		Unlisted Securities			16½	11½	Storage Tech	20½	– ¼
181	127	Acorn (10p)	180		46	31½	Tandon	20½	– ¼
76	56	Bus Comp (10p)	66	– 8	40¾	31½	Tandy	10½	– ¼
180	150	CPU (10p)	180	– 11	140½	96½	Texas Inst	10½	– ¼
123	103	Glen (10p)	115	– 11	34½	26½	Symshare	20½	– ¼
850	600	Comm Cable (CAP) (10p)	850	– 150	34½	26½	Wang Lab B	20½	– ¼
286	227	Feedback (10p)	227	– 8	11¼	8¼	Wyly	8½	– ¼
117	90	Hunting Sys (10p)	suspended						
82	74	Inbro (10p)	81						
264	227	Logic Sys Tech (20p)	264	– 5					
92	78	Lec (10p)	88	– 3		Pence	New Issues	Pence	
263	203	Lowney (10p)	263	– 5					
280	205	Micro Bus (10p)	280	+ 20	82	74	Dansesy (5p)	74	– 3
370	295	Micro Focus (10p)	370	+ 20	190	167	Norbits (5p) (USM)	180	– 3
210	178	Microgen (10p)	205	+ 10	200	188	Perkon (10p) (USM)	200	+ 2
378	378	Wise Sl (10p)	415		51	46	Xyratex (5p) (USM)	46	– 4
42	42	Minerva (10p)	42	– 5					
252	182	MMV (£1)	220	– 4					
256	216	Real Time (5p)	256	+ 8					
195	156	Reite & Hoskin (10p)	195	+ 5					
116	76	Scandata (10p)	116						
87	87	Software Comp (10p)	87	+ 3					
157	115	Zygal Dyn (5p)	139	+ 2					

The table shows the closing prices in London on Friday and in America on Thursday and the changes from the previous table. Highs and Lows have been adjusted where necessary. The Share Index is based on a selected list of the UK companies.



IBM hits $9bn heights

by Keith Holder

LAST year IBM climbed to new heights in profitability and further consolidated its position as the number one computer company, according to its annual report.

It was also a year in which the company's tactics paid off handsomely. New product launches and legal battles all went IBM's way.

This all added up to a handsome profit of over $9 billion and a return on stockholders' equity of 25.5% – a new high.

Shares reflected the company's success over the year, peaking at 133.5p in October. At this time the company had recently won its legal battle with Japanese manufacturer Hitachi, over alleged theft of secrets, and had just launched its new top-end 4300 mainframe, the 4381.

Yet it was not in mainframes that the company made its biggest impact. Peripherals sales, fuelled by the success of 3380 high capacity disc drive, eclipsed mainframe revenue, earning $10.74 billion.

Also well up, with a growth of 60%, were sales of office systems. These were bolstered by the company's Personal Computer sales, which are reported to have surprised even IBM itself.

IBM says the number of workstations in its own organisation is fast approaching the number of employees: 369,545.

The report gives detailed breakdowns into industrial groups for the first time. A spokesman says this is because the information had not been required before, but it could almost have been a skilful exercise, designed to intimidate rivals with its grand slam success in nearly every market it touches.

Even the decline in rentals revenue, down 11% overall at $4.78 billion is in keeping with the company's reported desire to scale down its activity in that area.

It introduced new support programmes for schools and universities in the US and Europe in the form of grants, loans of staff, and generous donations of equipment. The object of this exercise, says IBM, is to encourage excellence in manufacturing, systems engineering and to develop an international network linking universities and IBM research facilities.

Industry watchers put cost of Hitachi "Japscam" legal episode fine at about $300 million to the Japanese company, though they admit greater damage was done by IBM wresting software support rights to Hitachi sites using operating systems said to have been stolen, namely MVS/XA.

Bank backs UK mission to West coast

BARCLAYS BANK is planning to boost UK high technology exports by sponsoring a trade mission to the US West coast from May 13-25.

The mission to Los Angeles, San Francisco and Seattle is organised by the London Chamber of Commerce and Industry, with Barclays paying £700 towards the expenses of each of 20 participating companies.

Among the 50 organisations that have so far applied to join the mission are the British Technology Group's electronics and computer division, and Prosser Scientific.

Shares leap

INTEREUROPE, the UK's largest specialist in high technology documentation, has hoisted pre-tax profits by 34% to £528,000 for the half-year ended December 31, 1983. Turnover was 15% up at £3.5 million, and the company's shares jumped 20p to 265p on the results.

Earnings up 16%

MATSUSHITA, Japan's largest maker of consumer electric and electronic products, has lifted its earnings by 16% to 182.7 billion yen (£520 million) for the year ended November 30, 1983. Full year sales were up 9% 3,988 billion yen (£11 billion) and sales of office automation equipment rose by more than 10%.

April listing aim

AIDCOM International, a fast-growing market research and computer consultancy, is to seek a full Stock Exchange listing in April. Chairman Pratt Thomson says the application will coincide with the company's annual meeting in mid-April.

Micro takeover

LONDON-BASED number of microprocessors, Jarogate, has taken over micro systems distributor JK Wakeford Associates. The move gives Jarogate a lift into the public sector market for micros and communications products.

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SOFTWARE FILE

Canadians cut down Cobol slog

by Claire Gooding

A CANADIAN firm is presenting its "intelligent Cobol" to the US Department of Defence in a bid to revive the Department's Stars programme for software reliability.

Ontario-based Netron claims that its Computer Aided Programming technique cuts out 90% of coding, and also claims the technique can supply most of the requirements which the Department specified in its long-term plan for Stars (Software Technology for Advanced Reliable Systems).

"Stars was scheduled to be completed by the year 2000," explains Netron's marketing manager Paul Paetz. "We believe that we can supply most of what is required already. The Department has only specified in a very general way, partly because of the cutbacks. We are going to put forward a proposal to complete the specification with the programming tool within a couple of years."

Netron, based in Ontario, has specialised in Wang-based systems for the last couple of years, and recently launched the tool as a way of producing code for IBM.

Cobol seems an unlikely vehicle for a project which was planned to end in the year 2000. But the product was built to use Cobol only because of the commercial importance of the language, and according to Paetz, the concepts used could be adapted to another language such as Ada and any other target hardware.

"It uses machine and language-independent principles," says Paetz. "It uses the concept of 'frames', developed at Massachusetts Institute of Technology. Basically, one reduces the tasks into the smallest possible elements and then builds a hierarchy.

"What we have done differently is to apply artificial intelligence and engineering principles to software production. It is half way between the fourth and fifth generation of software."

The top uses some "expert systems" principles to define which of its re-usable modules can be used in new applications, which need further specification, and which need totally new code to be generated. The specifications are kept separate from the source code, which is generated complete, but can be amended by hand.

Netron is working on a version of the programming aid which can be used to automate existing applications rather than being of use only in building new programs.

Over half of its 55 research and development staff are working on the product, which already earns Netron's bread and butter by generating turnkey applications. This sells to software houses and other users for $16,000 for a one-terminal system.

Sisk comes to preach Pick

by Claire Gooding

TOP independent Pick consultant Jonathon Sisk is coming to the UK to give courses on the increasingly popular multi-user operating system.

Until recently, the Pick world has been a closed one, and training on Pick has been supplied only by the hardware distributors such as Electronic Data Processing of Sheffield, Interactive Data Machines of Doncaster, the University College of London, and Aston Technology, whose courses are tied to sales of Pick-based systems.

Now Taurus Technology, the training subsidiary of the Span group, has recognised the swell of interest in Pick and is supplying the first hardware-independent course on the system.

Sisk will be taking the first one-week course and also a one-day "Management Overview" in London in early June, and will be running a similar course for Span in Australia.

Sisk is well-known among the Pick community as the author of the *Pick Pocket Guide*, a neat pamphlet-sized guide which gives a quick-reference for programmers and operators on all Pick verbs and commands.

He has worked Pick closely with Dick Pick, originator of the operating system, and Pick's company Pick Systems, and has long experience giving training courses for Pick licensees.

"Demand for independent training has become noticeably higher in the last couple of years," says Sisk. "It used to be the case that the licensees wanted training only for their technical people, but now there's a definite interest in a general all-comers Pick course."

Sisk attributes the increase of Pick's sudden respectability and availability, now that long-standing law-suits have been cleared up, as well as Pick's arrival on powerful 68000-based 32-bit micros, which bring its price down.

According to Doug Woodward, managing director of the Span Group in the UK, the Pick course is complementary to the company's Unix training, not a rival or indicating a change of loyalties.

Micro Focus launches compiler

by Claire Gooding

MICRO FOCUS has announced a high-performance version of its Level II Cobol compiler for users of IBM's Personal Computer. The H/P Level II Cobol is aimed at development programmers who need extra speed in running times faster for some programs.

The H/P implementation uses a native code generator especially tailored for the PC. It takes the intermediate code produced by Level II Cobol and translates it into machine code, which runs three to six times faster than intermediate code, and up to 15

The new high-performance version supports the Animator and Forms-2 development tools. Its arrival on the scene means that the standard version of the Level II compiler will be re-named Compact Level II Cobol.

TALBOT . . . Alvey will evolve three generations of Ipses.

Alvey work is near

THE Alvey Directorate is poised to place the first section of its software engineering programme with ICL, GEC, York and Newcastle Universities, Systems Designers and the Microelectronics Applications Research Institute.

The job involves the software centrepiece, an Integrated Project Support Environment (Ipse) to be built over four years. The work will cost £4½ million, two-thirds of which will come from government. The directors are expected to place the contracts through the Ministry of Defence's contracts branch.

The contents of the research came into sharper focus at a meeting of the British Computer Society in London last week. Alvey director David Talbot, outlining the thinking behind the national plan, said they would evolve three generations of Ipses.

The first, under the Unix operating system and file-based, would be tried out on industrial pundits to get their views. The second, not necessarily Unix-based, would use the results with a clean-sheet approach aimed at achieving life-cycle coverage of program development, taking the distributed database approach.

The third would seek to incorporate what had been learned by them about intelligent knowledge-based systems.

He emphasised that although the directors had a small budget compared to many of their competitors, the research content of the Alvey Programme would be larger than that of most industrial R&D.

A broad strategy document issued last December announced the goal as an information systems factory to be designed at a cost of £65 million by 1989.

John McDermid, of Systems Designers, told the BCS meeting that it was improbable that formal methods of specification would be introduced early in the life-cycle of software development.

Systems Designers has already been involved with Ipse design with its recently-launched product Perspective. But McDermid admitted Perspective was only a first step.

CAP writes suite for Telecom

LONDON systems group CAP has won a £500,000 order from British Telecom and Securicor to write a management suite for their cellular radio venture Telecom/Securicor cellular radio (TSCR). The communications, administration and billing programs are to be written in Cobol and Assembler for the DEC Vax, and are due to go live next January. The software itself is worth £200,000.

Alvey teach-in

A TEACH-IN on artificial intelligence and its part in the Alvey Programme is to be held by the British Computer Society at University College, Torrington Place, London, on April 10, where guest speakers include John Taylor of the Admiralty and Bob Kowalski of Imperial College.

Fortran strong

PATENT attorney Pal Asija, who claims to be the first to have patented software in the US, has published a book to guide others through the maze. *How to protect computer programs* contains advice on legal and technical ways of protecting systems. Asija's patented system only existed on paper. He used a unique algorithm to retrieve narrative information from a database. The program was designed to run on any machine and operating system.

Book on patents

FORTRAN, the language of the 1960s is still around in force, as evidenced by the arrival of two 16-bit compilers on the micro market. Prospero, best known for its implementation of Pascal, has added the 16-bit Pro Fortran compiler to its eight-bit Fortran. Topexpress of Cambridge has released a Fortran compiler, Fortran 77, to run on the CTL 9000 32-bit mini and the National Semiconductor 16032. Prospero's compiler is available for CP/M, MS-DOS, and PC-DOS environments.

Students return

FOUR British computer students who took part in an international programming competition in the US came 21st out of 22 entrants. But the Thames Polytechnic team got a warm reception as the first non-American team ever to participate. The four students went to Philadelphia for the 13th annual contest held by the Association of Computing Machinery. The team consisted of Tim McNally, John Cavanagh, Duncan Macmillan and Robin Bater.

Informatics buys

SYSTEMS house Informatics is beefing up the applications side of its business with the acquisition of micro software house Cyma. Cyma, based in Mesa, Arizona, develops business software for micros for vertical markets such as law, accountancy, construction and medicine. Negotiations are to be finalised this month. Cyma's turnover is expected to be more than $6 million in 1984 with a network of over 2,600 dealers in the US.

MSA window

MSA is to add a windowing system to its Peachlink micro-mainframe financial suite. The new module, not yet named, is in preparation at present and is expected to be launched around the end of April as an optional extra.

Unix expert

ONE of the world's foremost Unix experts, Brian Kernighan, is to speak at the next conference and exhibition run by the European Unix User Group. The EUUG is holding its conference at the University of Nijmegen, the Netherlands, April 16 to 18.

Design expert warns of disasters

by John Riley and George Black

LARGE, real time systems buyers place too much emphasis on hardware requirements and fail to consider software design, says design consultant Ray Foulkes. As a result, disasters are inevitable, he warns.

Foulkes is chief engineer of the Scottish systems and software group of marine design consultants, Yard. The firm has played a key role in warship design and is now moving into the commercial sector.

"When buying micros, business users have had an awareness of the importance of software drilled home. But for some reason, that awareness isn't there when it comes to bespoke procurement for large systems," says Foulkes. "There are a lot of new people responsible for industrial computer procurement who are yet to have a disaster."

Portability, software configuration control and quality assurance are all neglected by procurers, he claims.

Software file is compiled by George Black.

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MICRO NEWS

IBM plans to build Intel chips

by Keith Holder

IBM HAS clinched a deal with US chip manufacturer Intel to licence build the 8088 microprocessor which forms the heart of its top selling Personal Computer (PC).

This move, completed last Friday, means that IBM has succeeded in assuring its own supply of the chip, demand for which has been so great that Intel has been unable to satisfy orders and has been shipping part orders for some months.

IBM has also recently increased its stake in Intel from 17 to 18.8%. Aside from guaranteeing IBM a supply of the 8088, the agreement will allow it to ramp up production of the PC and control the cost of the chip for its internal use, a move which can only put its competition under more pressure.

Manufacturers of IBM "thinka-like" micros use the 8088 almost exclusively.

A spokesman for IBM says that it has also acquired the rights to manufacture "certain other components," which he declines to clarify. This statement has sparked off speculation that IBM is about to launch its "Popcorn" multi-user system, which is thought to be due any time now.

Industry analysts are predicting that one of the "other devices" is the Intel 80286, a high speed microprocessor with advanced graphics capability, thought to be crucial for the Popcorn.

A spokesman for Intel says that the agreement will not effect Intel's revenue and it will continue as a major supplier to IBM. The speculations remain, however, about what IBM will do with its "bottomless well' of 8088 chips.

Industry analysts estimate that PC production will triple this year.

IBM is not alone in trying to secure a supply of this device. Commodore, which recently signed a technology agreement with Canadian firm Bytec-Comterm to use its technology as a basis for an IBM-compatible micro, is also reported to be having talks with Intel along the same lines.

Commodore is not saying anything, but such an agreement would eliminate the company's main argument for staying out of the IBM-compatible market – that it would have to rely on outside sources for microprocessor chips. Commodore has its own chip shop, MOS Technology, which supplies solely to Commodore and which designed the 6500 family processors used in present commodore micros.

Commodore already has an agreement with Zilog which, in principle, allows it to manufacture the Z8000 microprocessor under licence. Whether Commodore plans to make use of this option is shrouded in secrecy, and neither company would comment.

But Commodore is expected to show a Z8000-based machine and an IBM-compatible prototype at next month's Hanover Fair, and has indicated in the past that it is planning to launch into the lucrative office systems market.

By making such an office machine IBM-compatible, it would be able to rely on the vast software library written for the IBM machine for both standard and specialised applications packages.

It is this factor that has led over 60 competitors to adopt the 8088 as the central processor which combined with the MS-DOS operating system, allows them to ride into the market on the back of IBM.

Link offers alternative to rigid solutions

by Keith Holder

A HIGH-SPEED data communications link tailored to the industrial control market is announced by Intel.

Called Bitbus, it is designed to make communications between distributed control modules, factory robots and process controllers available through a single system, which uses less cabling and has the flexibility to be modified easily.

UK technical systems manager Bob Critchlow says: "We are offering users an alternative to the rigid 'black box' solutions which have dominated this market."

Bitbus is based on the company's earlier interconnect, Multibus, which Critchlow says is rapidly becoming an industry standard for communications buses.

As it is based on an established product there is already a large library of applications software to handle different communications protocols, he adds.

Bitbus is compatible with Multibus and can be used to connect devices on the factory floor to main computers for monitoring, Critchlow says.

He believes OEM designers of systems for industrial control will also find it easier to produce more flexible devices and implement changes to keep pace with new developments more quickly.

Intel has also launched two hardware and two software products to support Bitbus. Hardware comprises a single card controller for control modules, incorporating memory expansion sockets and digital input/output lines, and an expansion board to increase the number of single board drivers and memory chips.

System software, for multi-tasking and execution of control programs, and a software utilities package are available.

Shipments of the products are scheduled to start in the summer.

Festival of computing

THE Festival of Computing, from April 4-23, will offer something for Londoners in all walks of life, say the organisers.

It kicks off with a one-day Microelectronics and Information Technologies in Islington exhibition at Islington Town Hall, sponsored by ICL. Equipment from small home computers to larger business systems will be on show.

For those unsure of their need for micros the festival offers a general introduction to microcomputers seminars on how to select a microsystem, and, as April 10 open house at the North London Computer Club, at the Polytechnic of North London.

More details on 01-734 2907.

MILLS . . . "It is state-of-the-art manufacturing technology."

NatSemi aims for Scottish world first

THE UK is well on the way to having a world first in semiconductor manufacture and will probably get it if National Semiconductor's $100 million worth of plans for its Greenock factory come off.

The company aims to be producing chips on six inch wafers in pre-production runs by December and to be geared up to full production runs three or four months later.

As far as announced intentions can give an indication this will mean that Greenock will have the first factory to get that size of wafer into mass production. It will, incidentally, be the largest semiconductor plant in Europe.

Terry Mills, MOS operations manager at Greenock for NatSemi, says: "It is not state-of-the-art technology but it is state-of-the-art manufacturing technology. We will be taking a pre-production process and for the first time making it a manufacturing process."

This will not be the first time that NatSemi's Greenock plant pulled off such a coup. It was the first in the world to solve the problems associated with the mass production of four inch bipolar wafers.

Six inch wafers give roughly twice as many usable chips as do the current industry standard four inch ones. A number of manufacturers are already producing six inch wafers, including IBM, Intel and Motorola, but none are doing it in production quantities as yet.

Motorola has been quietly assuring all and sundry that it will be introducing six inch fabrication to its East Kilbride factory.

NatSemi will be using its XMOS II process which it claims will give it feature sizes down to 1.5 microns – not far from the one micron limit that most people in the industry see as the practical limit for mass produced chips.

It is a dry chemical process as neither NatSemi nor anyone else has been able to use wet chemicals to achieve this degree of precision in etching circuits on wafers.

And it will feature wafer stepping, a process in which only part of the wafer is defined at a time as opposed to the standard four inch wafer technique of defining the whole wafer in a single operation.

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PEOPLE

■ **Jane Smithard** (above) has joined Micro Focus as "in-house" legal counsel and company secretary. A barrister, she will be responsible for all secretariat functions, and will play a prominent role in the company's contract negotiations. She spent several years with Control Data. **Jeannette Lemon** has joined Micro Focus as personnel manager based in Newbury. For 15 years she worked for ICL.

■ **Alpha Microsystems GB** has appointed **Laurie Bright** as dealer manager. He joins the company from LSI.

■ The board of **Tymshare UK** has appointed **Jerry Goldman** (below) as managing director. He joined the company in 1979 as City branch manager and in 1981 was promoted to area manager. Before joining Tymshare UK Goldman spent nine years as a senior salesman with IBM in the UK and Israel.

■ **Qudos Systems** has appointed **Ian Temple** to be responsible for sales and marketing of the Rescue micro database product.

■ **Prime Computer (UK)** has appointed two support managers. **Peter Towers** is South regional support manager, with an area from North London via Oxford, and West to South Wales, while **Paul Dean** is support manager for the Scottish area. Towers has been with Prime for five years and was previously Northern district support manager for Prime's North and West District for a year. Dean has worked for Prime for four years in software support in Scotland.

■ **Norwel Computer Services** has recruited **Karl Kaegler** as sales director. He was previously sales manager with Automatic Information Management.

■ At a board meeting of **Datastream**, **Richard Stein**, finance director of BOC, was appointed a director of the company. **D. W. N. Pitts** resigned as a director on February 16.

■ *Langton, a computer and communication consultancy and system house has appointed Jerrold Donington an executive director; Jeffrey Steel has taken over as group manager in videotex and cable; Joan Gibson (left) has been appointed to similar responsibilities in office automation; and Ivan Newman (centre), has been appointed a business area manager. Newman, as a senior Burroughs man, twice won the annual Langton essay award. Other new consultants joining the Langton team include Alan Radlett (right) who will be in the telecommunications group.*

■ **Future Technology Systems** has appointed **Bernard Cruickshanks** as production manager. He was previously production manager with Osprey Electronics.

■ A new systems analyst has joined Alpha Micro. He is **Brendan Byrne**, from Randaro Computer Systems of Oldbury, West Midlands, where he worked as a support analyst.

■ **Brixton-based computer manufacturer Jarogate** has recruited a further three staff in systems design and sales. **Paul Horwitz** has been appointed systems design manager, and supporting him as systems designer is **Ian Anderson**. Sales manager **Ivan Stillwell** has five years' experience in running his own software consultancy.

■ **Ericsson Information Systems** has appointed **Tony Stevens** as national sales manager, Data Terminals Division. He was formerly Midland regional sales manager for Datapoint, and has more than 20 years' experience in data processing and information technology.

■ **Yogie Trivedy** has joined Turnkey & Applied Computing Systems as sales representative. Previously with British Olivetti, he has more than five years' experience of selling mini and microcomputer systems.

■ **Graham Coulson**, previously a programmer with Computer Ancillaries, has joined Maidenhead-based systems builders Micro Scope as an analyst/programmer. In his new position, he is currently project leader, responsible for systems development work on the Micro Space reservation and accounting system for tour operators, which is being developed for Panorama Holidays.

■ **Modular Technology** announces the promotion of **Garry Garforth** to UK sales manager, after six months as senior sales engineer. Previously, he spent three years as area sales executive with Codex UK (Motorola).

■ The Ryan-McFarland Corporation has appointed **Barbara Primrose** (below) as product support manager with responsibilities for marketing and customer support of the RM/Cobol product range in Europe. She previously spent several years with ITT, responsible for management information systems, and was later appointed software evaluator of ITT's Microcomputer Division.

DIARY

MARCH 15

Image Processing Using Starlink. BCS Dundee. R. Stobbie, Royal Observatory, Edinburgh. Angus Hotel, Dundee, 7.15.

Communications in the High Street. BSC Guildford. Stuart Senior, Deloitte Haskins & Sells. Ballroom Annexe, Stoke Hotel, Guildford. 7.00.

Today's Office is a Place; Tomorrow's will be a System. BCS West Herts. David Firnberg, BCS president. Aubrey Park Hotel, Redbourn. 8.00.

Introduction to CP/M. Course, Polytechnic of the South Bank, London. 9.30. £55 including refreshments. For further details phone 01-928 2790.

Visit to IBM Greenock, BCS Glasgow. Limited numbers. Contact J. C. Fleming on 041-886 4141.

CICS/VS Advance Design and Programming. Circle Education four-day course. London. £625. Further details from Brenda Harris on (0753) 889139.

CORE Workshop. Systems Designers Ltd five-day training course. Frimley Hall Hotel, Camberley, Surrey. £550 plus Vat. Further details from Keith Evans on (02514) 22161.

Fundamentals of Computer Operations. Compower two-day course. Training School, Cannock, Staffs. £80 plus Vat and seminar, London. Free. Details phone (0272) 290651.

Programming for Database DL/I. Compower four-day course. Training School, Cannock, Staffs. £305 plus Vat and accommodation. For further details phone Cannock 2511.

VM/CMS for Programmers. Altergo Education four-day course, London. £450. For further details phone 01-486 7288.

VSE Job Control for Programmers. Altergo Education two-day course. £290. For further details phone 01-486 7288.

Computers in Accounting; Developing Leadership Skills. MSS two-day courses, Worthing. Inventory Management Control. MSS three-day course, Worthing. Project Management and Control in DP; Basic Fortran Programming. MSS four-day courses, Worthing. For further details phone (0903) 34755/6.

Network Design. Frost and Sullivan 2½-day seminar. Park Lane Hotel, London. £425 plus Vat. Further details from Carolyn Budd on 01-486 0034/5.

Cobol for Non-Programming Staff. BIS Applied Systems three-day course, London. £360 plus Vat. Further details from Cherry Bigmore on 01-261 9237.

Working with Computers in Business. BIS Applied Systems five-day course. Queens Hotel, Eastbourne. £630 plus Vat. Further details from Cherry Bigmore on 01-261 9237.

Practical Systems Design. BIS Applied Systems five-day workshop. Bedford Hotel, Brighton. £630 plus Vat. Details from Cherry Bigmore on 01-261 9237

MARCH 20

Voice Input/Output. BCS West Works. Brian Pay, NPL. George Hotel, Huddersfield. 6 for 6.30.

Manufacturing Management. SIA Computer Services two-day workshop. Details: 01-730 4544.

Teleprocessing VTAM/SNA Concepts. Compower training course. Training School, Cannock, Staffs. £70. For further details phone Cannock 2511.

Conducting Feasibility Studies. BIS Applied Systems three-day course. Park Court Hotel, London. £345 plus Vat. Further details from Cherry Bigmore on 01-261 9237.

Introduction to Structured System Development Methodology/70. AGS Management Systems seminar, London. Free. For further details phone (0272) 290651.

Office Automation. Two-day seminar (also March 22/23). Information and Word Processing Association. Royal Lancaster Hotel, London. £235 plus Vat (IWP members), £255 plus Vat (non-members). For further details phone 01-242 8697.

Reducing Energy Costs with Computer Simulation. Control Data Energy Technology seminar, Bangor. Free. For further details phone 01-240 3400, ext 3305.

Data Analysis, Intelligence Engineering three-day course. Details phone (0635) 49695.

VS APL Fundamentals. Coding and Drury three-day course. 16, Berkeley Street, London W1. £300 plus Vat. For further details phone Alice Ingle on 01-493 6178.

Visit to Computervision (UK), Basingstoke. BCS Displays Group. Contact R. A. Earnshaw on (0532) 43175, ext 7462/6109.

Visit to North Tyneside Information Technology Centre. BCS Newcastle-upon-Tyne. Contact Ian Rees on North Shields 575029.

The BBC Micro. BCS North Staffs Joint meeting with the IEE. Speaker from Acorn. Physics Lecture Theatre, University of Keele. 7.30 for 8.00.

PEOPLE

■ *Threee former EDP employees have formed an independent software house specialising in the Pick operating system. The company, Oasys Software, was founded jointly by John Moore (left), previously software product manager at EDP; John Scholey (centre), who was with EDP for 14 years and an associate director and chief programmer; and Alan Watt (right) who has worked in the computer industry since 1971.*

■ **Ambitron** has appointed **Tony Cridland** as senior support engineer. He will be responsible for after-sales support for the new automatic credit charging system, Sentinel, and for Jupiter 7, the new colour graphics terminal. Before joining Ambitron Cridland spent six years with Computer Technology as a service engineer.

■ **Celdis** has appointed **Brian Fellowes** as systems applications engineer to increase customer support on the company's range of Data General and Mostek products. He joins from British Gas where he worked on instrument development at the London research station at Fulham. Previously he was with the National Physical Laboratory.

■ **Ferranti Computer Systems**, Cheadle Heath Division, has appointed a new sales executive, **Paul Fernback**, for its Fire and Security Systems Group. He joins from Carters, Thomas, Ashworth and Co, where he was export sales manager.

■ **IMI Computing** has appointed **Ray Davies** as marketing manager, with responsibility for the promotion of all the company's products and services in the IBM marketplace. Davies' data processing career spans 15 years, and in the last year, he has been promoting IMI Computing's specialist IBM 8100 services.

■ **Stephen Robinson** has joined Drive Computing as an account manager. He was previously with Olivetti where he worked for 14 years.

■ **Philip Crawford** joins MSA's Manufacturing Support Division with a year's experience within MSA already. He was previously account manager at MSA Inc, responsible for post sales support of manufacturing accounts in the Southern region, together with pre-sales system accounting. Crawford has spent the past five years in the US.

■ **Peter Deacon** and **Lawrence Jones**, previously with Vector General's former UK distributors R. and H. Systems, have joined Vector General as systems engineers, responsible for customer support and maintenance. **John Harris**, formerly with Software Sciences, also joins Vector General as systems engineer. Another new appointment is that of **Mandy Lowe**, formerly secretary to the managing director of Fire Engineering Associates, who becomes Vector General office manager.

■ **Microvitec** has appointed **Alan Bland** as national accounts sales manager. He was previously with Mattel Electronics as regional sales manager for Aquarius Computers and Intellivision.

■ Two management appointments have been announced by **BIS Software** to co-ordinate the development and launch of new systems. As planning manager, **Don Urquhart**, will be responsible for the company's technical and market research and for planning new products. He has been with BIS for nine years, before which he worked for ICL and Sperry Univac. **John Wills** becomes product marketing manager for BIS Software. He spent 15 years in banking before joining BIS in 1977. He was formerly general manager of BIS' Luxembourg offices.

■ **Apple Computer (UK)** announces the appointment of **Roy Stringer** as the product manager for the Apple 111. He previously worked as a systems consultant at New Micro Computers of Warrington, specialising in Apple 11 and Apple 111-based systems.

■ **Andrew Duncan** has been appointed Software Consultant by Automatic Test Engineering. He joins ATE from Hewlett Packard where he was a senior systems engineer involved in the training of personnel in the use of the 3060 ATE system.

■ **Dave Hayzen-Smith** has joined **Rediffusion Computers** as a salesman for the Manchester branch. Previously he worked for Vivon Computer Systems as sales and marketing manager

■ *John Cottrell, (left), managing director of STC Telecommunications and Jim Utterson (right), managing director of STC Communications International, have been appointed to the main board of Standard Telephones and Cables. Cottrell became managing director, STC Communications International in February, 1983 and took up his present position last July. He is also a director of two other STC companies: Standard Telecommunication Laboratories and TAL. Utterson became chairman of TAL and managing director, STC Communications International in 1983.*

■ **ISG Data Sales** has recruited two new area sales managers to promote its services and equipment in the East and South. **David Hopkins** began his career in 1959 working on the service side for Singers before moving into sales, where he has represented Triumph Adler and Delta Data. He will be promoting ISG's new range of Avatar terminal convertors in the East. **Vic Amato** joins ISG from Oceanic's Graphics, Micros, and Peripherals (GMP) sales department.

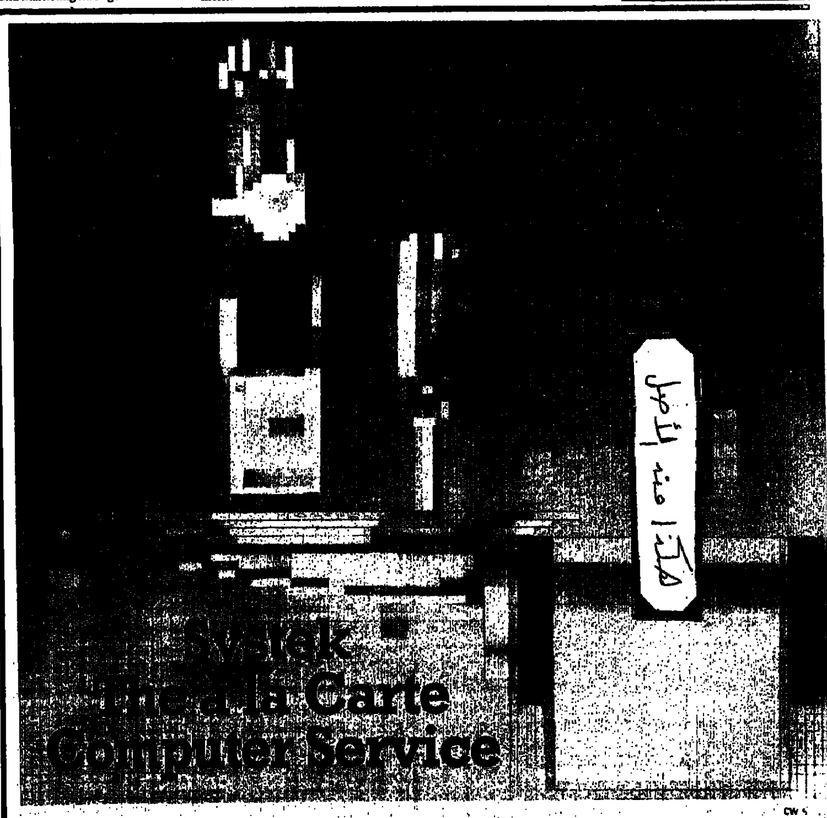
■ **Felix Learning Systems** has appointed **Alistair Hardie** as managing director. The company has already produced and published 18 interactive video programs which are available to business, industry and the public sector. Hardie was formerly general manager.

■ **Paradyne** has appointed **Roger Archer** as sales director, European distributors, with responsibility for sales through all European distributors including Israel and Turkey. He has held senior positions with Prime and ICL.

■ **Terry Cartwright** is appointed group director of marketing for Prism Technology (Holdings), the recently announced parent company controlling Prism's high technology distribution and development operations and EEC Publications. Cartwright joined ECC four and a half years ago as marketing director and became managing director two years later.

■ **Martin Cutler**, computer development manager in the Management Services Division of W. H. Smith based at Greenbridge, Swindon, is appointed technical services manager there. He succeeds **David Gayler**, who has taken up a new post with W. H Smith Cable Services.

■ **Hal Computers** has appointed **Ruth Long** (below) dealer support specialist, to liaise with and support Hal's dealer network.



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BCS JUBILEE LECTURE

Technology has evolved . . .

. . . but will the new fifth generation, based on micros, be revolutionary? Gordon Bell's lecture explored the theme

GORDON BELL, once head of engineering at Digital Equipment, and now chief technical officer at start-up company Encore Computer, yesterday (Wednesday) gave the Second Annual British Computer Society Jubilee Lecture, sponsored by *Computer Weekly*.

Bell was responsible for DEC's PDP -4, -5, and -6 minicomputers, and also worked on the PDP 11. He is a widely-published author on computer architecture and design and holds several patents in the computer and logical design area.

Reprinted below is some of the material used by Bell in his lecture at the Royal Society in London.

Bell's lecture is entitled "Computer Evolution". The abstract for the speech is as follows: since the ENIAC, the early Manchester machines, and EDSAC, computer development has been evolutionary. Revolutionary circuit technology has provided new structures following the time-worn path.

Can the new fifth generation, based on ultra-large scale integration, be any different, using either revolutionary concepts or more parallelism?

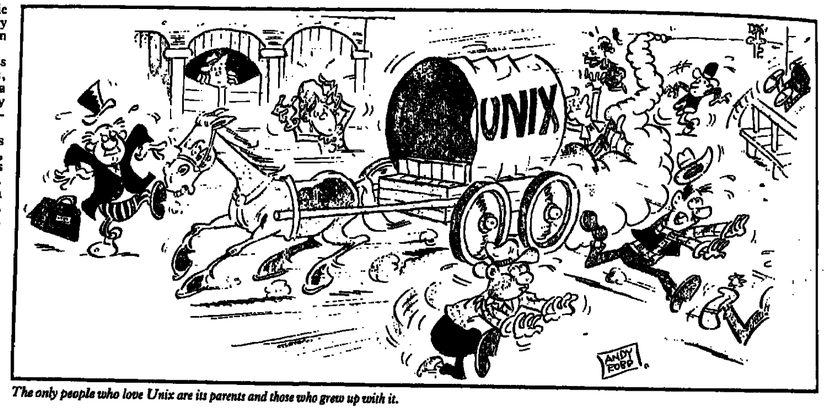
LIKE the minicomputer, hundreds of information processing products can be built using microprocessors and their associated semiconductor and electromechanical peripherals because they are so inherently universal (ie programmable). In fact, many more products can be built than with the mini.

Let's totally ignore the products such as cars, instruments, testers, etc. that embed a computer in a larger product and whose primary function is *not* information processing.

When PABXs and telephones compute and store information, they too must be considered as part of the computer industry. That is, there can be substitution among personal computers, games, terminals, typewriters, computing telephones and so on when they perform the same function as general purpose computers.

The rapidly evolving high density semiconductor and magnetic recording products are clearly high technology, representing significant investment, high risk and high entry cost for a company. However, the systems assembled from these components are clearly *not* high tech, and the barriers for entering an end-user OEM or system level business with a generic product are negligible, especially when compared with previous computer generations such as the minicomputer which demanded a comparatively large number of disciplines.

A company can be formed by a part-time president, someone who can buy and assemble the various circuit boards into a Multibus backplane, a programmer to buy and load a version of Unix and one or two helpers.



The only people who love Unix are its parents and those who grew up with it.

There are about 100 groups of one to a dozen or so engineers who are building workstations for various engineering and business professionals. Design consists of assembling the following:

- boards with microprocessors, disc, CRT and communication controllers that use one of several standard buses eg. Multibus, Obus, or VME/Versabus;
- appropriate discs and CRTs;
- stanard or custom enclosures;
- a licensed version of Unix available from a myriad of suppliers;
- generic software including word processing, spreadsheet, etc.

Each new start-up company believes its product and business plan will beat Apollo, one of the first entrants into the high performance workstation market. Just after going public, Apollo was valued at $1 billion dollars in the fall of 1983, on annual sales of less than $100 million with less than 1,000 employees.

In contrast, DEC has a valuation of about $4 billion with sales of $4 billion and a workforce of over 70,000.

A typical workstation start-up company compares itself with Apollo on two data points: its start-up date, which is usually one to two years after Apollo (when systems were easier to build), and the current month's annual shipments.

In this fashion, within two years each of 100 companies will be valued at $1 billion, giving a valuation of workstation companies of $10 billion to $100 billion – at least one order of magnitude greater than any optimistic projection of the market.

This valuation does not include the established companies, such as IBM, whose values are approximately equal to sales and who may believe workstations are mainstream products.

Thus today's assembly operations that permit this great overstatement about hi tech are at the root of what is surely to be one of the largest corporate re-evaluations in the history of American business. The only barrier to entering the industry as a board, software or system supplier is having a personal computer capable of generating a business plan.

Formal standards by US and international standards groups establish many of the standards (constraints) for designers. These are typically low-level signalling environment, communications links and languages.

De facto standards by various manufacturers provide the most important standards. These include microprocessor architectures, buses, peripherals, operating systems and application software file formats.

The levels, and corresponding standards, for today's micro-based products are:

- hi tech semiconductor microprocessors (Z80 through to 8086 through to 68000 or National 32032) and memory chips (16K through to 64K through to 256K bits/chip);
- boards based on a standard bus ($100 through to Multibus I through to Multibus II or Versabus/VME; IBM-PC cards);
- electromechanical discs (8in. floppy through to 5in. floppy through to 5in. Winchester disc);
- hardware systems are particular to the structure, but usually use Multibus form factors;
- operating systems (Basic through to CP/M through to MS/DOS through to Unix);
- languages (Basic through to Pascal through to C);
- generic applications (eg, word processing, spread sheets);
- vertical applications within various professional and intellectual domains (eg, accounting, structured design, project scheduling).

Large vendors such as DEC and IBM treat computing as a substitutable commodity in a complete market place. Computing can be traded off among the personal, shared departmental mini, mainframe levels over a price range of $1,000 to $1 million. (There is some evidence that growing use of personal computers increases the need for mainframes by giving more users access to tightly connected databases, instead of decreasing the need for mainframe power).

Computing carried out in any fashion should be treated as part of a single, available market.

Many alternatives are possible for supplying a range of products, from the purely general purpose base system, to the product that has been highly customised by hardware and software.

The critical mass (or economy of scale) is in the sidecale sales, distribution, installation and service of hardware products. In addition to having very good products, winning requires both the OEM and end-user channels to get critical mass of product distribution and wipe out costs.

An OEM approach usually requires a product range, not just a point product. An OEM customer often requires service, and always requires high-level applications and field support assistance.

An end-user approach requires both a wide product range and complete sales/service.

The applications software company (eg CAD) that has to invent its own hardware system is likely to become either obsolete with hardware, especially when reviewing what happened in the case of minis, or fall behind in its software development.

Furthermore, the company is limited by growth in its own market because investment is required in both vanity hardware and its specialty added value software. The hardware vendors will surpass the combination supplier, and the software-only CAD companies are likely to provide better software.

The barriers for entering an end-user OEM or system level business with a generic product are negligible

Since the perceived (and often the actual) price of software is low, a company that has a software product and wishes to enhance its sales volume does so by buying hardware and then re-selling the hardware as a complete system. In effect, a company competes with the mainline manufacturer.

While the gross sales are up, the costs can easily outrun the sales since the company must support a hardware too. In addition, the software company doesn't usually market the range of products that a mainline hardware supplier has. Such a system is likely to be less profitable than a pure, software supplier. In addition, the supplier is cut off from a large number of channels of distribution made possible when a basic software package is made to operate on many different base systems.

Look at the case of minis. The companies who came out on top did so by having fundamentally good general purpose hardware and then distributing it:

- as a generic product for a variety of uses. In the case of minis, DEC opened up many markets with the PDP-11 as the range included boards for embedded computing, a range of systems for personal computers, business, communications, general purpose timesharing;
- by facilitating the formation of a software industry to write both generic and vertical professional applications which the manufacturer integrated and distributed;
- through traditional OEM arrangements by encouraging others to embed a computer in other systems, as characterised by the early technical OEM marketing of DEC;
- through other channels such as distributors, distributors to subdistributors, retail outlets, installers, etc.

Software product segments, ie, new professional software application products, will form from today's experts in existing copanies which either have vanity hardware or OEM hardware because the true value of the product is completely contained in the software. ultimately, these companies will disappear to be replaced by: standard systems supplied by hardware vendors such as IBM; and software-only companies staffed by the experts who create the professional applications.

For a while, it looked as if a specialised market existed for the growing number of users who wanted Unix. Today, Unix promises to be the whole market, not a specialised market in itself.

Highly interactive computing with Unix is no longer a niche, but rather, the product constraint future users are all likely to demand, or at least specify. IBM has shown its flexibility in adopting industry standards rather than forcing its own in a de facto fashion. If customers want it, IBM will likely supply it. IBM appears to be near announcement of Unix across the range from PCs to mainframes.

In a similar fashion, every minicomputer and microcomputer supplier will supply this standard in a similar way. While the combined market is large, the fundamental market has not been expanded, but merely made more accessible by every manufacturer. The result will be a much greater fall-out of the smallest manufacturers who have inadequate marketing and manufacturing organisations.

Unix evolved along these lines.

Unix came from a reaction by Thompson and Richie to Multics, the large, joint MIT Massachussetts Institute of Technology Bell Labs project of the late 60s. It was written for a DEC mini and evolved to the PDP-11 in the early 70s.

DEC didn't give away operating systems to universities, especially the source codes; Unix was essen-

■ Continued opposite

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The fifth generation – can it add anything?

Virtually no organisation provides a full line of networked, compatible, multi-vendor products

■ From page 18

tially free. Unix is by most measures a very simple operating system, so to do anything useful requires other programs such as database access, special communications, programming and so on. Students and faculty could understand all facets of its internals and use. It was written in a high level assembly language, C, and as such could be modified. It was an excellent pedagogical tool.

Unix evolved to be used on other computers by being transportable. A team of people could carry it to another computer system, provided a C language compiler was available.

In turn, this created the notion that it might someday be possible to have a complete system that was machine and manufacturer independent. Users like this idea.

Chip makers and system builders who had no means of building software were able to get a system relatively cheaply. Thus, we have more support and the beginning of a standard.

Much work is required to have a system that supports 80s computing concepts. In order to evolve towards the generality demanded by the broad market, the extensions will include:

- Virtual memory. This function was worked out about five years ago and has been in operation for at last four years in the Vax version of Unix at Berkeley called 4.1.
- Special functions for real time and transaction processing. Unix is being extended and adapted in incompatible ways by diverse organisations.
- Human interfaces that are competitive with the PC. Unix grew up in a timesharing world using dumb terminals. Windowing and fast interaction are critical.
- Multiprocessing. With the micro, many companies started to extend Unix for multiprocessing.
- Networks. Given the origin of Unix in communications, we should demand modern communications capabilities.
- Fully distributed processing across a LAN to form LANCs. The University of Newcastle, Berkeley and several companies have all implemented incompatible systems for fully-distributed processing.

The Unix phenomenon illustrates the power of standardisation, and we can learn from it.

Like all operating systems, the only people who really love Unix are its parents and those who grew up with it. This is a large set. It also illustrates a recurring theme of standards: in order to make forward progress, one has to regress for a while.

Unix is almost a standard. There is not, however, a single version that is available in "bubble packs" that operates on a variety of systems. Each version requires the overhead of support, making the distribution again a matter of critical mass.

We have turned a large part of our future systems development over to AT&T for one of the key interfaces by adopting Unix. Unixco must take this responsibility, commensurate with its selling of Unix as a standard operating system.

The notion of a standard is good. But it must be evolved more rapidly than any single, large manufacturer can. It can be evolved, provided there is parallelism in the development using multiple companies which is a complete Unix industry.

On the other hand, Unixco is the single company doing and blessing all the extensions, we have simply substituted multiple competitive companies with one single behemoth!

The system has to be evolved in a reasonable fashion, not ad hoc.

Having Unix as a standard can let everyone enter the market on a commodity basis: yes and no. It's easy to develop the product, but how does one compete with the large organisations.

At the bottom line: Unix is the opiate that lets 100 companies form and assemble a product in a trivial fashion. The result will be far more brutal than in the case of minis, where at least some technical skills were required.

There are over 100 vendors in what is a commodity-like product valuing themselves at $10 billion to $100 billion for a limited market to engineers, scientists and business analysts. All have the organisational overhead to start, but none have the critical mass to succeed, except those which are currently well established such as Apollo, Apple, Convergent Technology and Sun.

Finally, the 32-bit personal computers (circa 1984-85), led by IBM using 256 Kbit chips and the Intel 286, will provide the power of the emerging 68000-based Unix workstations at a fraction of the cost.

Basically, this structure competes with old line mini and mainframe-makers, both of which are becoming distributors for supermicros, as in the Convergent Technology model.

Reliable computing like Tandem should no longer be treated as a niche, but rather something a user should be able to trade-off.

Because there is a somewhat different structure involved in building reliable computers, especially with respect to software, there is a possible niche market as evidenced by Tandem. As the overall reliability of computers increases, however, it is unlikely that anyone will pay even a 25% premium for reliability let alone 100%.

There is still interest in making a self-diagnosable, self-repairing computer that never fails, however. While this is possible for the CPU portion of a system, the software and peripherals do not permit this for some time.

With much lower priced machines, a broader range, and the introduction of full distributed computing in local area network (LAN) clusters, the need for high availability computers for incremental expansion will decline.

Several of the BUNCH have been relegated to decline through a declining base as all customers standardise on IBM compatible hardware. The microprocessor-based systems are a convenient product to market.

Companies in decline because of poor product competitiveness will witness rapid decline as high-performance, commodity-oriented, 32-bit microprocessors provide the same function as the traditional TTL-based mini, cheaply.

To sum up:

- There are no barriers to entering what is decidedly not a high tech industry.
- Economy of scale is most important in distribution and service.
- Economy of scale of manufacturing may hold for a single product and single company such as for the personal computer and IBM, but not in general.
- Time to market is far more important than economy of scale in engineering and manufacturing – which decidedly favours the entrepreneurial energy of start-ups who provide a single product.
- Large vendors such as IBM and DEC believe it's important to supply computing on a full service basis – virtually no organisation provides a full line of networked, compatible, multi-vendor products.
- Old line minicomputer and mainframe supplier markets will not easily be supplanted by new supermicro suppliers because system pricing makes distributing one-product, low-priced, complex systems difficult.
- Energetic and unique software applications (eg CAD) which run on a few energetic structures (PCs, workstations and supermicros) will fuel this generation.
- Unique structures (eg, home robots) are rarely revolutionary or protected by patents long enough to become established before the large supplier enters the market and takes over (eg, IBM dominates the PC market via its late entry).

Terminals	**What will happen when all terminals built by the already shaken out terminal companies become personal computers?**
COMPUTERS ON A DESK	
Home (and game) computers	**Note failures at Atari, Mattel, Texas Instruments. Expect more losses (eg Computing Devices, Osborne) now the IBM Portable PC is here. Finally, there's a standard – The IBM-PC.**
Portable personal computers	**Mature; first shakeouts and mergers occuring. Will it be completely eroded by PCs, smart typewriters, smart telephones, workstations, etc?**
Word processing	**A general purpose structure that will prevail!**
Personal computers	**Vastly over-subscribed with 100 68000-based Unix companies. Finale will come with competition from evolving high performance IBM-compatible personal computers.**
Workstations	**Will next PC attack this too?**
Shared micro (table or pedestal)	
DEPARTMENTAL AND GROUP-LEVEL COMPUTERS	
Supermicros	**Basically a mini replacement at lower cost.**
Clustered micros	**A supermini replacement . . . but what about the minicomputer suppliers?**
SPECIAL PRODUCTS	
High availability	**A niche, but greatly over-subscribed by Tandem, current and emerging companies.**
Special processors	**An infinity of types?**
HIGH PERFORMANCE, MAINFRAME COMPUTING	
Clustered micros	**Essentially zero cost micros deliver the best performance/cost. We expect gains through our ability to utilise these clusters through parallelism, which will mark the next generation.**
COMMUNICATION NETWORKING	
PABXs for voice/data	**Already over-subscribed.**
Local Area Networks	**Can exist if the standards firm up.**
Smart telephones	**A niche that add-ons to PCs will most likely fill.**
OTHER PRODUCTS	
Robots, voice input/output, etc.	**An infinity of products and industries are possible based on the microprocessor and specialised hardware and software.**

Microprocessor-based product classes.

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DATA TRANSMISSION

Very accurate, very Sanderson.

A total of 710 buses like these are in four Sheffield garages with 560 on the road at peak periods.

How to keep track of over 700 buses

South Yorkshire Passenger Transport Executive's buses weren't keeping to time until it discovered the concept of radio data transmission

PICTURE 710 buses housed in four garages in Sheffield, 560 or more of them on the road in the peak hour, three buses a minute leaving the garages in the peak period, and timetables to be kept.

There can be nothing quite as frustrating as having a well-defined and understood bus operating problem without being able to see a solution in sight.

In early 1982, that was exactly the position in which the South Yorkshire Passenger Transport Executive found itself.

In the day-to-day running of a garage, the pressure is on the regulator inspector. His job is to allocate the buses to each route and ensure that they leave the starting points on time.

Timetables, bus suitability and regular bus maintenance programmes all need to be taken into account so that the regulator knows the location and availability of all buses in the fleet.

So far so good. But the best laid plans are disrupted. No two days are the same. Breakdowns on the road ("crocks" as they are affectionately known), late starts, routes completed behind schedule, unplanned maintenance or cleaning – all upset the availability of buses.

Consequently, the regulator needs constantly up-dated information from numerous sources – the central control room, which is in radio contact with all drivers, the fitters in the maintenance depart ments, other garage personnel and even the other garages.

And he doesn't just need to be aware of problems as they occur; confirmation that things are going to plan is just as vital.

The Executive was aware that, despite a lot of willing people trying hard with telephones, paper and verbal messages, the regulators were just not in possession of all the information they needed to do their jobs properly.

Research had shown that the information available between the control room and the regulators was an average 45 minutes out-of-date: too late to be able to put right anything that had gone wrong. The lines of communication between the garages and the control room needed improving so that everyone would be instantly aware of individual movements.

A central database of information stored in a computer system, with access available to the regulators and control room staff through terminals, presented only a partial solution.

Regulators spend a fair proportion of time away from the garage. If a bus fails en route, they need to know immediately in order to check bus suitability, location and availability quickly to dispatch a replacement with the minimum of delay.

The Executive considered facsimile transmission between the garages and the control room, but all this achieved was another picture – another historical record. The Executive were on the verge of giving up, when a computer company contacted them.

Sanderson Computers was diversifying and had started to develop a hand-held terminal in early 1983. A hand-held device capable

No two days are the same – breakdowns, late starts, unplanned maintenance, cleaning – all upset the timetable

of two-way, real time communication with a distant computer system would solve the Executive's problem, thought Sanderson. It would also provide a marketable product suitable for a variety of applications other than traditional data capture.

An agreement was made to develop a prototype. The communication mode was critical. It must not inhibit the mobility of the regulator; it had to work without the risk of interference from vehicles and buildings, too. Infra-red and ultrasonics were both considered and discarded, but radio transmission was eventually chosen.

The first stage was to develop the prototype terminal so that real time communication between the terminal and a remote computer was possible.

Trials were successful, and Sanderson set out to develop a field-operational production model. Transmission speeds were upgraded and response times improved with the selection of a powerful multi-user microcomputer. General Automation's Zebra range fitted the bill and Sanderson became a dealer for that company.

Utilising the Pick relational database operating system, Zebra provided a proper database structure with an efficient language for systems development. Sanderson Computers also had had experience in developing commercial Pick systems.

During the summer of 1983, the passenger transport systems software was re-written and refined to run on a Zebra micro and production models of the terminal – now known as Script (Sanderson Computers Radio Interactive Portable Terminal) – were produced.

Script incorporates a CMOS microprocessor (NSC 800) with up to 16K bytes of ROM; logic circuitry for minimising power consumption and reducing sensitivity to voltage variations; and it uses a replaceable, rechargeable nickel cadmium battery pack.

It has a range of up to two miles and weighs under two pounds. It has a liquid crystal display of eight lines by 20 alphanumeric characters with a 42-key keyboard.

The keyboard layout is tailored to individual requirements to minimise the number of key depressions and speed up function selection. The screen can display an abbreviated version of a normal VDU format.

For the Executive this means that the regulator can use Script to access or update centrally-held files in the same way as he can at a conventional terminal in his garage.

Sanderson's passenger transport system is designed to control vehicle allocations for particular routes with pre-determined departure times. Routes to be allocated are displayed in time sequence order. By depressing a function key – find – the Script terminal will display the vehicles available and suitable for that timetable.

The information can, of course, be called up on the screen in the office. A bus is then allocated, and information regarding whether the vehicle is available for a full or part day is displayed. The regulator may then select dispatch, and the system will automatically record the departure time and change the bus's location to signify that the bus is on the road.

Up to six Script terminals may be connected to an intelligent base station, which is in turn linked to

The communications made must not inhibit the regulator's mobility

the Zebra micro installed in the garage. In a complete system at the Executive, a larger Zebra micro will probably be installed in the control room, if current trials are successful.

The control room inspectors, who are in radio contact with all drivers, can feed up-to-date information into the system such as crocks and delays, and so on. The garage-located Zebra will be connected to the larger central system. The latter constantly interrogate the garage micros for any changes to keep both files up-to-date and running in parallel.

Should a vehicle break down, another may be allocated to take its place from the same garage, another garage or from maintenance, by accessing the vehicle's available file.

The total system works in real time – everybody has access to the same up-to-date information. Instead of working with a time delay of 45 minutes, information is now only 15 seconds out of step with events.

The Executive has now installed

The regulators were just not in possession of all the information they needed

a General Automation Zebra 2500 with 256K bytes of memory, 35 Mbytes of disc storage, four visual display units and an intelligent base station driving two Script terminals.

Before going operational in one garage, the system has been installed for training. Inspectors, both regulators and control room staff, who have welcomed and worked closely with the project, particularly in the design of the keyboard layout and function names, are jointly writing the operator manuals with management.

More akin to a day in the life of the system than a traditional manual, this will provide a reference for new users to see what should be happening at any time in a 24-hour day.

Training will be completed in early 1984, and the first garage will go live with the "bus output machines" as the Script terminals have come to be known among the inspectors. Initially, a 4800 baud communications line will link a VDU in the control room to the garage-located Zebra.

The intention is to avoid implementation problems as far as possible, with a fully tried and tested system and a trained staff.

Chris Longley, the Executive's operating systems manager, comments: "We have waited a long time to find what we believe to be the right solution, and we want to get it right. The co-operation of the inspectors has been very good.

"We want to start out with people believing in the system and with the equipment assisting regulators positively in performing their tasks with less pressure and more effectiveness."

The second phase will be to install additional systems in the three remaining garages, a larger Zebra processor in the control room and the development of more extensive management reports.

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PICK

Pick rewards its pilgrims

After two years Pick Systems has launched its new proprietary operating system. Jonathan E. Sisk analyses it

THE third annual Pick Spectrum Conference, sponsored by the International Database Management Association (IDBMA), provided a platform for Pick Systems to describe its newest products to several thousand devoted followers, who made the "pilgrimage" to the MGM Grand Hotel in Reno, Nevada, last month.

The announcements of the completion of the in-house implementation of the Pick operating system on the IBM-PC XT and of the release of the company's proprietary operating system called Open Architecture Release 1.0 were also made to the delight of those users who have waited patiently for Pick to deliver what it has been promising for the last two years.

For those unfamiliar with the Pick operating system, it is a virtual memory-based, multi-user operating system (OS) with an integral database management system that runs on a wide variety of systems, from the IBM-PC XT to the IBM 4300 mainframe.

It is merely coincidental that IBM's name appears on both ends of the Pick implementation spectrum, as Pick also runs on such machines as the Honeywell Level-6, many Motorola M68000-based systems, the Intel 8086, the Zilog Z8000 and a handful of machines based on discreet processors, such as the Hewlett-Packard 3000 and the Microdata Reality and Sequel.

Users of the Pick OS maintain an almost fanatical loyalty to the product and its eclectic originator, Dick Pick, who is often referred to in the press as being the guru of this cult-like following.

In a recent issue of *Computer Systems News*, Pick was captured on a front page photograph hanging upside-down in his gravity boots. He was quoted as having said that this position "makes him think better". An equally off-the-wall article in *Business Week* quoted "puckish Pick" as spelling the OS "Unix" "E-u-n-u-c-h-s".

His irreverence for traditional methods and approaches is only exceeded in its fervour by his devotion to the ongoing development of the operating system that bears his name.

Pick is especially proud of the new version, Open Architecture Release 1.0. It is a somewhat radical departure from the standards that he himself established back in 1971. Initially entitled R84, Open Architecture paves the way for the Pick OS to become compatible with the "real" world.

"This release is our response to all of the enhancement requests that we have received over the years from our users," Pick states. "A more appropriate name for the release would be Yes. It allows users to do virtually everything they have ever hoped for.

"The name, Open Architecture Release 1.0, was chosen to replace the previous convention of using the calendar year in which the release was made in the name. The last official release was R80.

"This does not mean that each new implementation since 1980 has been 'old' code. On the contrary, each licensee has been provided with the most current release of the system.

"Subsequent releases will be called 1.1, 1.2, and so on. When a major change is implemented, we'll call it 2.0."

Whatever the name, afficianados of the Pick OS have already learned that it provides an astonishingly high degree of application portability, both between new releases and even between different machines.

PICK ... Referred to as the guru of the cult.

Pick has no intention of changing this phenomenon. Open Architecture 1.0 will be completely compatible with users, current application software.

Many new features have been added, which users may wish to incorporate into their applications, but none will be mandatory. Among these new features are:

- Multiple ABS areas. Virtual code for the Pick OS is contained in the ABS area. Historically, there was one ABS area per system, but with this new scheme, it will be easier to provide logical

Pick Systems will rebate $50 to users who return the registration card

partitions so that other operating systems (or multiple copies of Pick) may coexist on the same system.
- Unlimited item size. Previously, data items were limited to a maximum size of 32 Kbytes.
- All frames are now 1K each. A frame is the means by which Pick addresses disc. In previous releases, frames for storage of data were each allocated 512 bytes, and ABS frames were either 512, 1,024 or 2,048 bytes, depending on the specific machine implementation. The advantage gained is two fold: first, with twice as much data now being stored in a frame, more data will stay in main memory. This will reduce the number of disc accesses necessary to retrieve data.

Secondly, the virtual object code will be better stored on disc. This will result in fewer disc accesses for OS code frames, because they will already probably be in main memory. The overall effect of the new frame size is a decrease in disc accesses and an increase in throughput.

- Simplified system interfaces. While this probably will be more appreciated by Pick's programmers, the end-users will still gain indirectly. The brave few that attempted to write Assembly code in the field had to follow logic paths across many frame boundaries when debugging their software. Each system mode now has only one entry point, rather than multiple entry points.
- Linking loader. This is the process in which Pick Assembler object code is loaded on to disc. During the load process, all external references within the mode are resolved. This results in the dynamic resolution of all previously unresolved references to the mode at run time.
- Floating workspaces. Workspaces under the Pick OS are the storage areas into which data is moved during processing. Historically, these workspace areas were at absolute locations on disc, and each was fixed in length, typically between 66 and 127 frames (33-63K). The new scheme permits workspace areas to be assigned dynamically, according to the actual needs of the process, and are potentially limitless.

All of the above features of Open Architecture Release 1.0 will be transparent to its users. The only noticeable difference will be the increase in throughput.

Those features that are more likely to catch the attention of the public will probably be introduced in subsequent releases. Among these are: enhanced communications, including X.25 and SNA; the incorporation of a C compiler; the introduction of a CP/M emulator; execute statements in Pick/Basic, which will make it possible for programs to exit to any process and return control exactly where the program left off; TCL (Terminal Control Language) stacks, so that users can recall, modify and re-execute any previously-entered commands; extended precision in Pick/Basic, which will provide floating-point mathematical operations, utilising an extension whereby precision will be increased to 64 bits; and incremental file-save/transaction log.

Seasoned Pick veterans who have experienced power failures will particularly appreciate this last feature. Each time a transaction is written to disc, an image of the transaction is placed into a log file, where it can be immediately written on to a tape or diskette, or temporarily held on disc for the time specified by the operator. The net effect is that the system is always backed-up.

Should a machine failure occur, the user would simply load and restore the last file-save tape. Upon completion, the user would load the transaction log tapes generated since the last file-save, which would then load the updates that had occurred since the earlier tape.

A couple of other features to be introduced are Pick/Basic subroutines from Access dictionary items and phantom processes.

Access is Pick's English-like data retrieval language which uses dictionaries to define where data is stored and how it should look on output. While the Access language is a powerful tool, there are inherent limitations to its capabilities, due to its limited subset of functions permitted in dictionary items. With the extension, Access will be capable of performing complex tasks formerly available only in Pick/Basic programs.

Phantom processes will permit processes to initiate multiple background tasks, without tying up the terminal from which they were generated.

Overall, Open Architecture Release 1.0 provides the answers to the questions that sceptics of Pick have raised in the past.

The second major announcement is the availability of the Pick OS on the IBM-PC XT, using standard hardware configurations from IBM.

Priced at an end-user licence fee of $495, this is a true full Pick implementation, offering all the same features and compatibility as

Almost all of their applications will port straight across

the rest of the Pick implementations. As an added incentive to end-users, Pick Systems will rebate $50 to users who return the registration card enclosed in the package.

The base configuration supports three asynchronous terminals and a system printer. Pick on the XT totally supplants MS-DOS.

Users who wish to continue using non-Pick packages, such as Lotus 1-2-3 or Wordstar, may partition their disc into two or more partitions, using the FDisc command provided under MS-DOS 2.0.

The XT version of Pick has an FDisc command that allows users to change partitions without rebooting the system. Due to the special attention that Pick pays to the treatment of main memory, special protection software has been incorporated into the Pick XT so that the system has time to flush to disc all of the write-required memory buffers prior to shutdown.

Several implementation-dependent features are planned for the XT version of the Pick OS, including extensions to Pick/Basic that will allow use of either colour or monochrome monitors, along with all of the bells and whistles, including foreground and background colours, protected fields, visual attributes such as underlining, blinking and XY co-ordinate addressing for cursor control.

During the last year, two Pick lookalikes have been announced on the IBM-PC. The first of these was Revelation, from Cosmos of Seattle, Washington. The second came from CDI Information Systems of Bellevue, Washington, the licensee for Pick on the IBM Series/1.

While neither of these products is claimed to be an exact replica of Pick, both offer products that have a moderate degree of similarity, especially in the area of their respective Basic programming languages and Access-like command structures.

Current Pick users who are potential customers for either of these products would be well-advised to investigate the technical differences between their current application software and the format required under the emulation. They may find that conversion costs could account for a hefty slice of their total investment.

The Pick implementation, by contrast, is a "pure" version of Pick. As such, almost all of their applications will port straight across without conversion. Since most Pick-based systems use Winchester magnetic tape as back-up media, a potential media incompatibility exists for users wishing to migrate to the XT.

For this reason, it is very likely that Pick will provide a means by which applications and data can be transmitted over asynchronous lines to solve this problem.

Clearly, the Pick OS is a system whose time has come. Pick was user-friendly before the term became popular.

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Jonathan E. Sisk is president of JES & Associates, an Irvine, California, based firm specialising in services for the Pick operating system. He is author and publisher of The Pick *and* The Reality *pocket guides.*

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INLAND REVENUE

PAYE ticks along – but not without problems

Computerisation of PAYE drew cynicism when it was mooted. Judith Morris reports on progress

THE computerisation of the Inland Revenue's Pay as You Earn (PAYE) scheme is one of those sagas that will run and run, but cynics are beginning to wonder if the system itself will ever match the saga and run. The cynics would be surprised to find that behind the scenes, the system is quietly working away on schedule to complete the mammoth task of computerising the tax system.

The idea to computerise PAYE was introduced in 1980 when the chairman of the Inland Revenue, Sir William Pile, told the House of Commons that the system would be up and running by 1982. The year before, Sir William had told the Commons that it was "an appalling state of affairs" that the Inland Revenue was not computerised and was using "such antiquated technology and equipment".

But four years later, the massive plan to change the tax system – which at £200 million represents one of the biggest orders ever placed by government – is still far from completion. The plan has been beset by difficulties right from the start, and many people never believed that it would work anyway.

The Inland Revenue itself has suffered from changes in government. One of the first delays to computerisation was caused by the Heath government halting plans so that it could bring in tax credits, which were in turn dropped by the last Labour government.

The original scheme, thought out back in the 1960s, was to centre all clerical and data processing work in one building along the lines of the Centre 1 scheme in East Kilbride, Glasgow, which runs the Scottish tax system.

But the Scots found that they were experiencing long delays in getting replies to their inquiries, and it was becoming increasingly difficult to lure experienced staff to the grim outskirts of Glasgow, where highly qualified personnel were needed to cope with the demanding and responsible work.

One of the first delays to computerisation was caused by the Heath government halting plans so that it could bring in tax credits

Instead, an alternative scheme was proposed, which turns out to be the one being implemented, albeit after several "rethinks" when the Cabinet thought the sophistication of new proposals could lead to embarrassing breakdowns. It was also concerned that a lack of skilled DP staff in the Civil Service could lead to a DVLC-type fiasco.

The proposals were drawn up by the Inland Revenue, the Department of Industry and the Central Computer and Telecommunications Agency (CCTA). They involved the setting up of 12 regional tax centres which would each monitor the entire tax operation throughout the year. About 17,000 terminals would link about 600 regional offices to the 12 processing centres holding taxpayers' records.

But just because the nature of the system had been chosen did not mean that the matter was settled by any means. Afterwards came the heated battle over the juicy contract. And it was a fight in which everyone – government, unions, MPs, UK firms, US firms – jumped into feet first. Patriotism, competition and uglier emotions ran high. No-one could afford not to have a say in the debate over the plummiest contract to be up for grabs for many years.

What happened is history now – ICL scooped the mainframe contract with its 2955 and 2966 systems launched in November 1980, and followed it up – a mere two years later – by winning the contract to supply 17,717 DRS 20 desktop terminals.

The deal could not have been made at a better time for ICL, but with the good publicity came the bad; many cynics took the opportunity to say that it was the government's Buy British policy that had clinched the deal and not the quality of ICL kit – and the Americans went away with their tails between their legs muttering that it was all a fix.

So far, so good – but it is now 1984, and what has been accomplished? Some of those involved in the project from the start believe it is going very well, all the more so because "no-one would believe it would ever happen".

The first stage of computerisation is now well under way. One site, at Telford in Shropshire, has been chosen as a pilot site with the aim of ironing out all the bugs there before the process is repeated at 12 other regional Inland Revenue sites. The Cabinet shied away from an original "big bang" plan to computerise all 12 sites simultaneously.

On the other hand, the inevitable problems have arisen – the most obvious being the refusal of the Inland Revenue staff to use the new equipment until management agree not to impose compulsory redundancies. About 400 staff stand to lose their jobs through computerisation of the PAYE system.

The fact that the problems accompanying the scheme were all human was raised as long ago as November 1980, when the Tory Bow Group produced a pamphlet, written by Philip Vergo of Logica and Industry Minister John Butcher, who was then a mere MP. The pamphlet set out to define the potential difficulties in computerising the PAYE system and pointed out that the actual processing equipment was basically straightforward. The main hitch was that IR management and staff were too concerned with what was politic rather than what was practical.

This warning has been true, in so far as concern that computerisation would lead to redundancies has led to some industrial action, recently resolved, which has naturally held up progress. Members of the Inland Revenue Staff Federation (IRSF) have now accepted a new technology agreement, after 400 tax officers who had been suspended following their refusal to work with the new equipment were recommended for reinstatement.

Many of the problems arise because of the peculiar nature of the Civil Service, which has a shortage of skilled computer staff and finds it difficult to retrain and recruit them because of its strict salary and grading structure.

The federation's recent agreement has irritated other Civil Service unions, still awaiting new technology agreements to be made with the government, who had hoped for a single Civil Service deal including a "no compulsory redundancies" commitment. The agreement does not guarantee that there will be no redundancies because of computerisation, although the government has said that it will do its utmost to avoid any losses.

Any Inland Revenue staff who lose jobs may well be redeployed in other Civil Service departments – another bone of contention, as other Civil Service unions wanted a "no replacement of staff" agreement, and friction could arise if federation members need to transfer to other unions.

To minimise this difficulty, a joint employer-union experiment in the 14 West Midlands tax districts has been set up for the full determination of working arrangements – a step which could lead to drastic changes in Civil Service working patterns, desperately needed if computerisation of major departments is to go ahead.

But not all the problems caused by PAYE computerisation stem from manpower. For ICL, the system was its shining star, a chance to be judged by the big systems market in general. It could not afford a repetition of the DVLC shambles in Swansea, for which it got a great deal of the blame. ICL was especially sensitive at the time of the PAYE tender for it won the contract on the back of two large systems which were not even on the market then.

■ Continued opposite

PILE . . .He started it.

Sir William told the Commons it was an "appalling state of affairs" that the Inland Revenue was not computerised

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INLAND REVENUE

PAYE proceeds but not without its problems

■ From page 22

the back of two large systems which were not even on the market then.

But the Inland Revenue is more than satisfied with ICL's performance to date. Steve Matheson, who is the project manager for the PAYE computerisation and has been involved with the system since its inception in 1977, speaks about the company's involvement in glowing terms.

"ICL won both orders – for the mainframes and the local office equipment – under fierce competition," he says, "and the company had to pass a number of stringent tests on the 2966 in June 1982, which it did successfully."

At the moment, ICL is working very closely with the Inland Revenue and other consultancies involved in the scheme and will continue to do so for some time. About 40 ICL staff are permanently on site, although Matheson pointed out that the number fluctuates with varying levels of support, depending on current activity.

About 300 staff work at the Telford development centre, which represents the nucleus of all Inland Revenue computer development work and will continue to do so for some years as the system evolves and changes to cope with evolution of the system.

According to Matheson, everything is on target.

"The completion date for testing was fixed on October 1, and we met that," he says. "We actually went live on October 3, but that's only because October 1 turned out to be a Saturday. Anyway, it was on schedule.

"There have been some hiccups," he explains, "particularly the negotiation of the new technology agreement and the industrial dispute with the court case, but apart from that the computer system itself is working very well under live operation."

This is the year when the entire system will be evaluated. Matheson now feels there is sufficient experience of live operation to make a recommendation to the steering committee of ministers to extend the system to the rest of the country – and that recommendation will probably be made in July or August this year. The decision, feels Matheson, will probably be taken in summer.

One of the most crucial stages in the computerisation is due to start next year. This will be the opening of the first remote processing centre, which will be started up in September 1985, several months after the remaining 40 offices in the West Midlands region are linked.

The remote processing centres – of which there will be 12 eventually – are an important part of the strategy. The first one will be opened in Peterborough and deal with the Eastern Counties Inland Revenue administrative area. If all goes according to plan the local tax offices will be linked to this centre by autumn 1985.

Shortly afterwards, the Welsh processing centre is due to open in Cardiff.

"These moves will be particularly important," explains Matheson, "and the opening of the centre represents a crucial strategy. One of the design aims was not to have on-site systems software specialists, so we have had to build a remote diagnosis system, so we can monitor all the faults from Telford and solve the problems."

Obviously, the systems software people will need to be on-site temporarily, but the steps taken to remove them from the day to day operation of the system are significant for the Inland Revenue and for ICL.

At the moment, civil servants, ICL people and representatives from other companies involved in the project all work hand in hand. Two external companies are also working on the development team at Telford.

Computer Sciences Corporation (CSC), the UK arm of an American software house, provides technical support and technical management and has been involved with the project since 1978.

"Ten staff are actually involved in line management," says Matheson. "This is all part of the structure of the project which comprises consultants, civil servants and ICL staff.

"This system works very well," he comments. "The consultants don't just give technical advice, they give direction as well, which is very important. It means they can't just suggest things, give advice and walk away from it leaving someone else to sort it out. They have to make it work without people."

Although the consultants are not intended to be a permanent feature of the Inland Revenue scheme, their presence is supposed to ensure that their specialist skills, be they in management or technical matters, will eventually be passed on to civil servants.

The other company directly involved in the project is Pactel, which has provided an automated control system.

"We are monitoring about 20,000 to 30,000 different activities, so we needed a very sophisticated project control system. This is a major tool for keeping all the development work on time," says Matheson.

The major activity now for the Inland Revenue team is planning for the conversion of the 6,000 local offices, which vary in size enormously. All of them will have to be rewired for the DRS 20 terminals, and the scale of the task is staggering.

ICL was specially sensitive at the time of the PAYE tender for it won the contract on the back of two large systems which were not even on the market then

"About 20,000 staff will have to be retrained and about 27 million tax records will have to be converted," Matheson says. "And then about 1.1 million employer records will have to be converted, too. Eventually, there will be a database of about 100 gigabytes."

As technology and the law change, so too will the Inland Revenue's system. There is a clause in the agreement between the government and ICL which actually allows for taking advantage of changes in technology, so that the system is not static and will change according to continual development.

For example, the ICL 2966 machines will be upgraded to 2988s, not because there was anything wrong with the 2966s, but just because "that's the way things were going".

Matheson also expects that when the Estriel "supercomputer", which ICL is building with advanced chip technology from Fujitsu, is available, the Inland Revenue will get one for testing.

"People here are working on that already," he says. "There is a great deal of on-going testing work. A super dual 88 is being built which will take us on the path to the Estriel. We may not do it in the end, but we have to do the testing."

The extension of ICL's CAFS to the new CAFS ISP has also increased the confidence of the Inland Revenue in the system, and it has been piloted at the Centre 1 site in Glasgow. Because CAFS' main advantage is in fuzzy matching, names and addresses of the public can now be matched up to employer and local tax office without having to send out those irritating letters which infuriate everyone.

CAFS immediately brings up a National Insurance number – the key for all the computer records – when given a name and address or even part of a name and address, and everything can be traced without having to trouble the employee.

An efficient tax system is viewed as an anathema by most people. The Inland Revenue has long been the butt of jokes. The computerisation of the system has aroused the public interest and has had a great deal of media attention. But it looks certain that the lessons learned at the DVLC in Swansea will not be repeated by the Inland Revenue, or by ICL.

Both organisations have taken considerable trouble to iron out difficulties before they become insurmountable, and the careful training of staff should ensure that the predictions of the Bow Group never come true.

Judith Morris is editor of Computer Talk.

Authors with foresight . . . BUTCHER (left) and VIRGO (right).

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SOFTWARE MONTH

Mainframe package vendors face a personal challenge

Their task is to link personal computer applications to mainframe databases. How do they go about it?

WALSH . . . "Ability to access different databases is less vital or relevant to Peachpak II."

THE astonishing growth of the personal computer, claims Mark Bennett, manager of the Systems Software Division of RTZ Computer Services, has presented traditional vendors of mainframe package software with a new challenge.

"The availability of local processing capabilities has highlighted a requirement for immediate access to the centralised corporate data on the mainframe databases," he says. "The challenge is how to provide that access in a meaningful and useful way."

The task is to link personal computer applications to mainframe databases. But the problem is that there are many applications on many different microcomputers, all needing to link to many databases on many mainframes. It could be called a problem of multiple many-to-many relationships.

Clearly there is no simple solution. The complete answer would be to design a new mainframe database with its own universal communications capabilities to a new set of universal and integrated personal applications. But this is not likely. The project is too large, and it would still depend on the ability to persuade existing users to abandon existing databases and existing application programs.

The complete answer would be to design a new mainframe database with its own universal communications capabilities

There has to be a compromise, and it is in the area of compromise that most of the current solutions differ.

First, however, we should look at a statement of the requirements of a mainframe to microcomputer connection.

Bennett thinks these are fourfold. "Firstly, selectivity. This is the key to the micro connection in business situations, because working with too much data, if it doesn't overload the micro, is as meaningless in a business situation as working with too little data. The link needs to be designed to process only a personalised amount of data — the data needed to enable the right decision for each problem.

"Secondly, database access. Given the way most applications systems have been developed historically, it is unlikely that the data required on the manager's desk comes simply from one system. It is likely to be scattered across several files or databases. Some means of pulling this data together is required.

"Thirdly, security. The ability to access across several applications requires that strict security be applied to the lowest item of information on the files, especially if real time updating is to be performed.

"Finally, the results of the local processing should update the files in real time without some intermediate batch process."

Many software suppliers consider that Bennett's third and fourth points are incompatible. Such suppliers question the usefulness of updating a production database with the results of local processing. This is certainly the view of Informatics, its marketing manager Raiyo Shroff explains that the executive users' requirements do not usually include updating the database, but merely interpreting it. The data traffic need therefore be only one way.

"But what we are looking at," Shroff continues, "is the use of the mainframe as a mail box for the results of local processing. In other words, the results of sales models from divisional sales managers could be made available, via a mail box facility, to other managers and to the group sales director."

It may be worth relating Bennett's "link requirements" to some of the packages available. Bennett describes the system from McCormack and Dodge, the Interactive PC Link "Within M&D's Millenium system all the requirements for a successful PC link are met: Selectivity, security and real time processing are all supported as standard generic functions that the link can call upon."

Bennett's requirements for database access and selectivity are met in two of the PC Links methods of downloading data: selective and chained.

"Selective downloading," he continues, "depends on the in-built query function within Millenium — an English-like language with Boolean logic facilities. It uses an inverted list index which will allow any VSAM file to be accessed by the content of the record as well as the key.

"The chained download allows a set of stored queries to be executed in any desired order. This enables several different files or databases to be accessed in the same selection.

The Link's security is based on that within Millenium. "It is a user defined facility which can allow the real time configuration of access and update restrictions. Passwords protect the application, function, screen, field, search value and logical query; and access can be further limited by time of day and day of week.

"The output interface for uploading," Bennett concludes, "is a file which the upload interface can map into normal CICS message format. Its mapping facility places the micro data in the correct fields in the mainframe message. Uploading is a real time process. As a result, the revised information is immediately available for further downloads and revaluation."

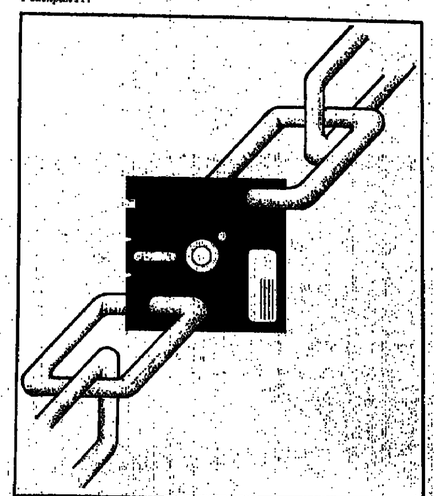
One of the best know of the mainframe to microcomputer links is Executive Peachpak from Management Science of America (MSA).

MSA director Stuart Walsh explains how the system matches the requirements specified by Bennett: "The PeachLink communications software enables the user to select online any combination of individual fields from MSA's mainframe systems database and to transfer the current contents of those fields for a specified range of records directly to the personal computer in an online real time environment.

"No intermediary files are created, so the data extracted is taken directly from production files and the information is always the most up-to-date available, thus conforming to the real time selectivity criterion."

The ability to access different databases is less vital or relevant to Peachpak II since it is designed primarily for MSA proprietary databases. Security, however, is handled at both mainframe and microcomputer levels."

BENNETT . . . "The challenge is how to provide that access in a meaningful and useful way."



SOFTWARE MONTH

Double luck provided answer

Two coincidences gave rise to the VisiAnswer PC-database link

LUTZ . . . Wanted specialist.

FYLSTRA . . . Was looking for an association with a mainframe software specialist.

INFORMATICS General Corporation, one of the giants of the software world, which historically has specialised in 370 architecture on IBM mainframes, has now added the PC to its repertoire.

The move started about five years ago, before the PC had arrived, but at the height of the rise of the micro. Raiyo Shroff, the company's marketing manager, explains that at the time the company realised the microcomputer had come to stay, and that the market would specifically need a way to link the micro to the mainframe.

Informatics started by buying an Ontel microcomputer and developing methods of linking it to the mainframe.

About two years ago it was realised this was a mistake, but at the same time the first of many happy coincidences occurred — IBM launched its own PC, and forced new standards and maturity on to a previously fragmented microcomputer market.

Overnight (almost) software vendors were given the sort of microcomputer prospect pool that had not been seen since the heyday of CP/M-80's eight-bit domination.

The arrival of the PC came at exactly the right time for Informatics: lessons had been learnt on the Ontel, but irreversible steps had not yet been taken. One of the lessons had come from a re-appraisal of the needs of the PC user — who is not the traditional 3270 user with whom mainframe software vendors are familiar. The 3270 user wants reports or, as Shroff puts it, "he wants financial or industrial archaeology — information on and from the past."

The PC user also wants information, but information from which to predict the future. "The PC user is an executive skill worker who wants to work in planning mode. PC user-friendliness is completely different from 3270 user-friendliness, so we knew we had new lessons to learn," says Shroff.

At that time Merritt Lutz, group vice-president, Software Products Group, began to look for an association with a micro software specialist.

And then came the second great coincidence. At the same time Dan Fylstra, of VisiCorp, having travelled the same route in reverse, had begun to look for an association with a mainframe software specialist. It is from this association that VisiAnswer was born.

"Each side," says Shroff, "learnt from the other. VisiCorp knew how to interface with the naive executive user, and we knew how to interface to the mainframe production database. The result is VisiAnswer."

There is one more great coincidence in the history of VisiAnswer, one that is embodied in its name: VisiAnswer is a confluction of two names — VisiCalc from VisiCorp, and Answer/DB from Informatics.

Answer/DB sits on the mainframe and is able to interrogate almost any standard 370 architecture compatible database, including IDMS, Adabas, Total, IMS, DL/1, and so on. By interfacing VisiAnswer to Answer/DB, Informatics was able to link the PC to a variety of different databases at a single stroke. So it immediately fulfils two of the four criteria laid down by Informatics for the product. "It is," Shroff says, "both universal and selective. It is universal at the mainframe end (in that it interfaces to all databases) and selective at the PC end (since the user can select precisely that information he wants). It is not just a file dumper."

The other two criteria include a naive interface (gained courtesy of VisiCorp), and absolute security.

There are two aspects to database security: sensitive information must not be available to those unauthorised to see it, and the entire database must be protected against accidental or malicious corruption.

"The PC user is an executive skill worker who wants to work in planning mode"

VisiAnswer has two main protective devices. The first is that it is simply a no-update system. Live data may be drawn from the database and processed on the PC, but it may not be returned to the database.

The second protective device lays within the Answer/DB portion of the system. Each user is given a user profile that defines access authority down to individual field level within any number of files from up to 10 different databases.

Junior personnel clerks, for example, could be restricted from access to the personnel data of staff salaried at above a certain level. This profile then relates to a password on the individual VisiAnswer floppy discs, which are themselves set up and controlled by the DP department. The result is that VisiAnswer can be run from any IBM-PC anywhere in the world (provided only that it can be connected to the mainframe), but only in conjunction with a valid password and within the restrictions associated with that password.

The naive interface includes all the tricks learnt by VisiCorp's many years of successful involvement with the microcomputer. Each VisiAnswer disc working through the PC knows precisely all the file structures available to its own user.

A question and answer sequence guides the executive through the process, at all times stating what has been done, explaining what can be done and prompting for what should be done. And if this isn't enough, PC quality help files are also available.

When the task is defined, VisiAnswer translates it into a series of Answer/DB commands, which in turn retrieve the specified information from the production database and send it to the PC. At this point VisiAnswer can convert the retrieved data into a VisiCalc data file which can then be processed locally by the VisiCalc spreadsheet program.

Since a defined task can be stored by VisiAnswer, the user soon establishes a library of selection routines to cover his most used selection criteria.

At the moment VisiAnswer can interrogate many different IBM databases, but links only to the one PC application.

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A dBASE II User Group has been formed. For further details contact User Group Secretariat Caroline Tanner on 0908 568866.

TAYLOR . . . "Links must operate on both personal computers and in mainframe environments."

How IBM has brought micro repectability

Like it or not, IBM's PC has changed microcomputing

WHETHER you like the company or not you cannot ignore IBM, for the IBM-PC is changing the face and structure of microcomputing. The hardware is already technologically dated, but it has done more for the microcomputer market than any other product, hardware or software, since CP/M80.

It has brought respectability to the market; it has given the major and senior mainframe software vendors a sufficiently large and stable target to justify sophisticated software. And this software, in the form of mainframe to micro links, is drawing the microcomputer, grandchild of the mainframe, up into the adult world of serious computing.

With one or two exceptions, the vast majority of mainframe to microcomputer links are IBM database to IBM-PC links.

But within this conformity there are many different levels of solution, albeit largely with one basic similarity: the majority of solutions depend on some form of interpreter, whether it is primarily hardware or software or both, that sits between the PC and the mainframe and translates the required format of one to the required format of the other. It is the complexity of this intermediate interpreter that defines the extent of the solution.

At its simplest level it is little more than a protocol emulator, allowing the PC to "talk" to the mainframe, and perhaps even to send and receive whole files. As the interpreter gets more complicated, it could become a box that can send and receive files from many different types of personal computers and send or receive them to or from many different types of mainframe. But at this level it is still primarily a protocol emulator.

"While it is easy enough to connect the PC physically to the mainframe, it is not so easy for the end user to get access to particular software"

The next level is a level of software intelligence that recognises the file structure and organisation of the mainframe production database, and can interpret into and out of that database. If it is particularly intelligent, it will be able to handle many different types of database (ultimately on many different types of mainframe); and if it were even more intelligent it could handle many different applications on at least the leading personal computers.

But since all of this is impossible all at once, different suppliers have opted for different compromises. In some cases it is a single application link to a single database; sometimes it is a number of applications linked to one database; or one linked to many databases. And the prime motivation behind the approach taken is always the existing standpoint of the supplier in question.

An example of an advanced protocol-emulating-box approach can be seen in Norsk Data's ND-100CC Communications Controller, a standalone device that can link together almost any mainframe, mini- or microcomputer. The ND-100CC is a 16-bit minicomputer with up to four Mbytes of MOS memory that can, under software control, allow up to 25 microcomputers access to up to four mainframes, regardless of which micros are accessing which mainframes at the time.

The system acts as a powerful file server with all the major communications protocols. But, since it can support up to 2,000 Mbytes of its own Winchester storage, and can run its own word and data processing applications, it can also be used to bind together a corporate DP structure diversified by the past acquisition of a large number of different mainframe and large minicomputer systems.

A different approach to the micro/mainframe problem is at a level somewhere between simple 3270 emulation with basic file transfer, and the true software links inherent to packages like VisiAnswer, Peachpak and others. An example here is the Host Interface Manager developed by IMI Computing, the computing arm of the IMI industrial manufacturing group. This package is basically a file transfer system (bi-directional), but it also enables the central DP department to customise and simplify PC access to the mainframe.

Basically comprising its own programming language, it is able to present the PC user with a menu of the available options, whether they are PC resident or mainframe resident, and to perform the relevant logging-on and software loading requirements that are necessary for each different menu specification.

David Williamson, managing director of IMI Computing, says: "Host Interface Manager was originally developed for use within IMI. We standardised on IBM's SNA because it is already central to the way we communicate around the company. We've already got nearly 400 terminals connected via 3270 clusters and IBM 8100 communications processors to our host 3033N. And these are rapidly being supplemented by a growing number of personal computers.

"We perceived the micro, and more recently the IBM-PC, as an additional opportunity rather than a threat to professional data processing, and have consequently set about integrating the new facilities with these already offered by our Information Centre.

"While it is easy enough to connect the PC physically to the mainframe, it is not so easy for the end user to get access to the particular piece of software or data he requires. The end user just wants to see a menu of his applications, whether they are run on the PC in native mode, whether they access data from the host, or are entirely run on the mainframe.

"They may be a combination of text, graphics and spreadsheet. Hence the need for a product like Host Interface Manager."

One of the simplest software links can be made where a package has already been implemented in both micro and mainframe formats. If the two systems are truly file compatible, then the link need be little more than a file transfer utility. Software where this is possible would include some of the major financial modelling systems like Final from D. M. England and Partners, the Wizard range from Comshare and Finar from Corporate Modelling Consultants.

Another example is IFPS from Package Programs Ltd. Rod Tyler, chairman and managing director, talks about his company's philosophy: "The demand for better software links between personal computers and corporate information centres, is growing rapidly as more and more managers make use of microcomputers as decision support centres.

"These links must operate on both personal computers and in mainframe environments and should facilitate the transfer of information from corporate databases to personal computers and back again. They need to be powerful enough to accommodate the far-reaching demands of users throughout the corporation and they must also be flexible enough to adapt to needs that differ from one department to another, and even from one user to another.

"This facility is available to users of IFPS and IFPS/Personal. IFPS/Personal models can be solved by mainframe IFPS, and mainframe access to the models and data on the mainframe while allowing to each user of IFPS/Personal complete flexibility to interrogate and change the assumptions in the models on the PC. The corporate planner can consolidate the individual user's model with the mainframe IFPS and distribute access to all users of IFPS/Personal.

"It is," he adds "an example of how technology has developed to the point where users no longer have to conform to the requirements of the computer. By reflecting individual users' requirements, such new software tools will result in more responsive systems and a more creative and individual approach to management."

Richard Joyce is product manager of Network Systems Corporation. "When you look at the total problem of micro to mainframe communications," he says, "there are two distinct aspects to it. One is a networking problem, the other an applications problem. Network Systems has, since the mid-1970s, been addressing the networking problem. With the release of our Netex Network Executive software in 1981, we solved this networking problem. In Netex we have a deliverable, stable, high performance, end-to-end networking structure, which conforms to OSI (Open System Interconnection) standard, Level 5 Session Layer. There are now over 300 Netex installations around the world.

"The applications problem, however," he continues, "is much more intractable, and one that will fully be solved only by an internationally agreed standards solution. This will clearly take many years to reach, since it must be a rationalisation of the many, varied and growing number of dissimilar proprietary DBMSs and PMSs.

"Under the weight of our users' demands, and as an interim measure, we have implemented a Bulk File Transfer (BFX) facility. BFX effectively creates Remote Job Entry facilities between dissimilar vendor machines. This allows, for example, an IBM-PC to communicate with an IBM 370, DEC Vax, Cray, and so on.

"Towards the end of 1984 or early 1985 we shall release our Interactive File and Record Transfer (IFX) facility. This will provide users with the kind of file transfer facilities already existing between proprietary products within proprietary networks like DECnet and PrimeNet. The difference is that is will allow file transfer across dissimilar machines.

"For the moment, however, the days of data item update across dissimilar operating systems and machines, both locally and remotely, are still a long way off."

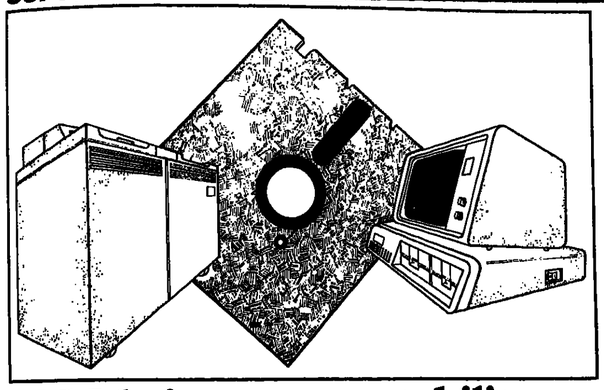
If the problem is to transfer data quickly, easily and securely between the PC and the mainframe, then one obvious solution is to design a software package that does everything for you, and provides a bridge between existing mainframe databases and existing microcomputer applications. But another obvious solution is to design a new and integrated package to deal with data on both the mainframe and PC simultaneously. This would clearly be an expensive process, but one that we can expect to see in the future.

"The applications problem is much more intractable, and one that will fully be solved only by an internationally agreed standards solution"

Meantime, both Hoskyns and Cullinet have compromised by acquiring or developing an integrated set of micro packages (KeepIt for Hoskyns, and the Cullinet PC Software); and developing a linking method to an existing mainframe database (Hoskyn's Ramis II from associates Mathematica, and Cullinet's IDMS/R Codasyl database).

Cullinet's CPCS is an integrated set of PC software tools (spreadsheet, text editing and formatting, graphics and a relational database) that can be linked to the mainframe IDMS/R via the Information Database (IDB). This is a mainframe package that serves a purpose conceptually similar to Informatics' AnswerDB/VisiAnswer. It lies between the PC user and the mainframe database and acts as an interpreter. The only real difference is that IDB links only to Cullinet's proprietary IDMS/R database, while the Informatics' product links to any mainstream IBM database.

That said, the detailed difference between the products is more extensive. IDB serves two main purposes; as an intermediate repository of up-to-date data, and as a network manager for the different PCs. The latter is achieved by allowing PCs access to the same corporate data within IDB while at the same time allowing the system to be used to provide a mailbox facility.



IBM brings respectability

■ From page 26

"The effective link of PCs to a mainframe cannot be provided by file transfer software and terminal emulation hardware/software"

tain either physical data or real time logical views of the production data.

Philip Dyer, technical director of Cullinet, comments: "The effective link of PCs to a mainframe cannot be provided simply by file transfer software and terminal emulation hardware software. The Cullinet Information Database used in conjunction with Cullinet's PC software provides an intelligent and transparent link between the mainframe, where data security and integrity are easily controlled, and a PC, where the power to drive end-user type tools is readily available.

"The mainframe provides an ideal vehicle to store end-users' information which has been created on a PC. With Cullinet's Information Database this storage is protected by standard security and back-up routines – which is a much better solution than trying to copy 10 megabytes to floppy discs.

"By using Information Database, information that has been created on a PC can be held on a mainframe and also be available for other authorised PC users. But more importantly this information can also form part of the company's database and subsequently be used in large-scale, high performance production systems.

"The Cullinet Information Database allows a controlled flow of information to – and very importantly from – the PC user. Data collected by PC users has already been paid for by the company. Using Cullinet mainframe/micro software this data is available for use by other employees subject only to the user's authority."

By the concentration of marketing effort on the corporate PC as an executive workstation should not be allowed to hide all the other uses of the microcomputer. Micro Focus, a UK company much in the news recently with announcements of increasing profitability and hints at future acquisitions, last year moved out of London to rural Berkshire, and in the process installed something like 14 kilometres of communications cabling in its new offices, with the avowed intention of putting a networked IBM-PC on every employee's desk.

Peter Hewitt, the company's marketing manager, explains the rationale: "The scenario we envisage, is one in which both software developers and application end-users can enjoy micro-to-mainframe facilities.

"For the software developers we will provide tools that allow the programmers to work on a microcomputer rather than on a mainframe. These, unlike the mainframe, are naturally interactive, providing an excellent program development environment.

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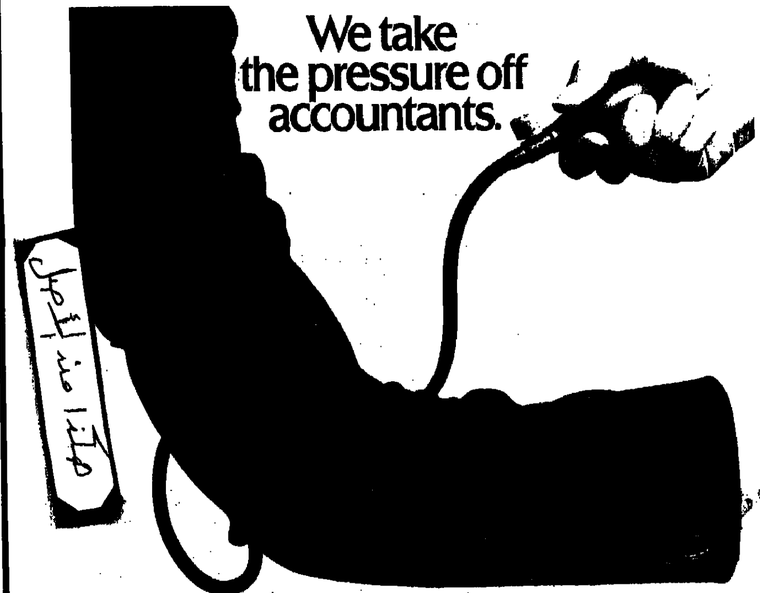

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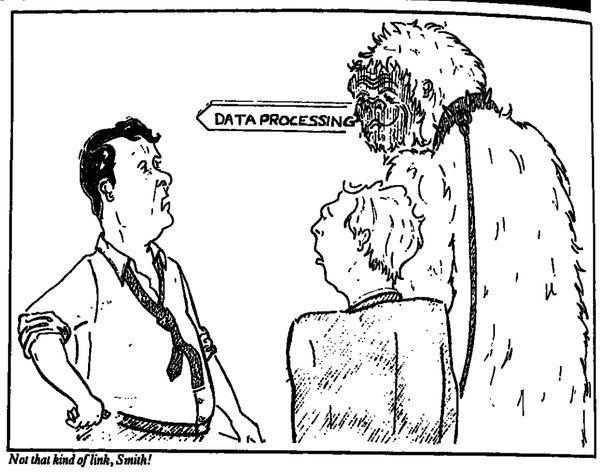
SOFTWARE MONTH

Where to get the tools to form the links

THE following survey of software tools to link personal computers to mainframes covers most known products but should not be regarded as exhaustive:



Not that kind of link, Smith!

ADP Network Services
179/193 Gt Portland St
London W1N 5FD
Tel: 01-388 1912
Product: Datapath
Mainframe: DEC 10, DEC 20
Software: TSAM, Screen, Fastock
Micro: IBM-PC, XT
Software: Lotus 1-2-3
Software to software: yes
Mainframe updates: yes

Cullinet Software
Cullinet House
82 The Broadway
Stanmore, Middx HA7 4DU
Tel: 01-954 7333
Product: Cullinet PC Software
Mainframe: IBM
Software: IDMS/R+Information Database
Micro: IBM-PC
Software: PC-DOS
Software to software: yes
Mainframe updates: yes

Digital Microsystems
Molly Millars Bridge
Molly Millars Lane
Wokingham, Berks RG11 2PQ
Tel: (0734) 793131
Product: Hinet
Mainframe: IBM, ICL, HP, CMC etc
Micro: DMS, CIU
Software: ICL, IBM
Software to software: yes
Mainframe updates: no

Hoskyns Group
64-78 Kingsway
London WC2
Tel: 01-242 1951
Product: ITSeries
Mainframe: IBM
Software: almost any, particularly Ramis II
Micro: Now IBM-PC, XT. Soon HP 150, Wang, Digital
Software: ITSeries, plus a number of 3rd party standards
Software to software: no
Mainframe updates: yes

Husky Computers
PO Box 135
Foleshill Road
Coventry CV6 5RW
Tel: (0203) 668181
Product: Husky and Husky Hunter
Mainframe: any 2780 compatible
Micro: Husky hand held computers
Software: CP/M
Software to software: yes
Mainframe updates: yes

Informatics General (UK)
Africa House
64-78 Kingsway
London WC2B 6AL
Tel: 01-242 0770
Product: VisiAnswer
Mainframe: Any 370 architecture IBM or compatible
Software: Any mainline IBM-compatible DBMS
Micro: IBM-PC, XT
Software: PC-DOS, VisiCalc, VisiOn (others coming)
Software to software: yes
Mainframe updates: no

Interactive Data Machines
Scawthorpe Hall
Great North Road
Doncaster
S Yorks
Product: Pick operating system
Mainframe: IBM 4300
Software: Pick on the mainframe
Micro: IBM-PC
Software: Pick on the PC
Software to software: yes
Mainframe updates: yes

Management Decision Systems
Old Crown
Windsor Road
Slough
Berks SL1 2DL
Tel: Slough 74201
Product: Express-Mate
Mainframe: IBM, Prime
Software: Express
Micro: IBM-PC
Software: Lotus 1-2-3, VisiCalc, dBase II
Software to software: yes
Mainframe updates: yes

Management Science of America
MSA House
Cedars Road
Maidenhead SL6 1SA
Tel: (0628) 39242
Product: Executive Peachpak II
Mainframe: IBM
Software: all commonly used database management systems
Micro: IBM-PC, XT
Software: All Peachtree, plus 1-2-3, VisiCalc, dBaseII, and DIF files
Software to software: yes
Mainframe updates: yes

Mathematica
79-83 Portland Street
London W1N 5RA
Tel: 01-580 3681
Product: Ramis II-Ramlink
Mainframe: IBM and compatible
Software: Ramis II, ISAM, VSAM, Adabas, IDMS, IMS, DLI1, Total
Micro: IBM-PC and 3270 look-alikes
Software: Novo DOS. Soon Unix
Software to software: yes
Mainframe updates: yes

Network Systems
Kings Ride Court
Kings Ride
Ascot
Berks
Tel: Ascot 23399
Product: HYPERchannel
Mainframe: most
Software: most
Micro: most
Software: most
Software to software: yes
Mainframe updates: yes

Package Programs
91 Blackfriars Road
London SE1 8HW
Tel: 01-633 0121
Product: IFPS Interactive Financial Planning System
Mainframe: IBM, HP, Honeywell, Sperry, DEC, Prime, Wang, Harris, CDC, Data General
Software: Focus, Info, etc
Micro: IBM-PC, TI, Sirius, etc
Software: IFPS/Personal
Software to software: yes
Mainframe updates: yes

Wang (UK)
Wang House
661 London Road
Isleworth
Middx TW7 4EH
Tel: 01-560 4151
Product: Wang VS & PC
Mainframe: Wang VS
Software: Wang DMS and Document DBs
Micro: Wang Professional Computer
Software: Wang core software
Software to software: no
Mainframe updates: yes

Zynar
122/3 High Street
Uxbridge
Middlesex UB8 1JT
Tel: (0895) 59831
Product: Plan 2000, 3000, 4000 LANs
Mainframe: IBM
Software: most
Micro: IBM-PC and Apple
Software to software: no
Mainframe updates: yes

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Life emerges from the Silicon Fen

Peterborough is rapidly becoming a high tech town. Nuala Moran went there to see why it is such fertile ground for computer firms

WE'VE all heard of Silicon Valley, and latterly of Silicon Glen. The latest contender in the silicon stakes is Silicon Fen – otherwise known as Peterborough.

This appellation was coined by the managing director of one of the companies which started life in the area. A look at what's happening in the computer industry does seem to indicate that Peterborough is approaching that "critical mass" situation, where companies get drawn into the town because other companies are there and people are interacting to spawn new ideas and new companies.

But it's still a long way from the stage where everybody who's anybody has to be there.

In a sense Peterborough has grown of necessity. It was designated a new town in 1967 and the Peterborough Development Corporation was set up in 1968 with the brief to expand the town's population from 81,000 to 147,000.

This it has done by developing the infrastructure. The corporation provided houses, offices, factories, schools, roads and leisure

The number of jobs has gone up during a time when many parts have seen unemployment rise

activities. And it went out and persuaded companies to move into the area.

There are a lot of statistics to illustrate exactly what the corporation has done. Perhaps the most telling is that the number of jobs in the town has gone from 45,500 in 1967 to 67,650 now, during a time when many parts of the country have seen unemployment rise and rise.

This begins to make it sound as if there was no life before the Peterborough Development Corporation. In fact Peterborough already boasted two significant computer companies, Peterborough Software and Geest Computer Services.

It also had several large engineering firms which have been transformed by the application of computer technology. One of them, Baker Perkins, has a Department of Trade and Industry-sponsored CAD/CAM awareness centre and another has indirectly spawned a recent high tech start up.

The development corporation takes credit for enticing some big computer users into the area. Large installations include those at the British Sugar Corporation, Thomas Cook, the Trustee Savings Bank, Pearl Assurance, and the latest "acquisition", Lloyds Life Assurance.

Explaining its choice of Peterborough, David Whitney, Lloyds Life Assurance management services manager, says: "We've looked at moving from the City a number of times and realised it was likely to be desirable at some stage purely for cost reasons. When the decision was finally made, we gave instructions to agents that we wanted to relocate within a certain distance of London and set the costs we were prepared to pay.

"It turned out that Peterborough had the right office at the right price. At the level of taking the decision on where to go, we were just looking at fundamentals like cost. Having made the decision, we do realise that Peterborough has other attractions.

"For instance, an advert in the local paper for computer staff brought in 200 replies. From this we will offer nine or 10 jobs, which is a fantastic return on one ad.

"And we found that most of our senior people are prepared to relocate." There will be about 200 staff to start off, but there is space for about 380.

"Moving to Peterborough," Whitney continues, "probably won't save us that much on computer staff salaries, but it certainly will on clerical staff. If we'd just moved to the edge of London, we wouldn't have made those savings on salaries, and the M4 corridor is too expensive for offices.

"Other areas in the South-east are very expensive for housing, so it would have been difficult to get our staff to move."

It has not always been so easy to get computer staff to go to Peterborough. When Thomas Cook went there in 1975 it lost all

'If we'd just moved to the edge of London, we wouldn't have made those savings on salaries"

but two of its 30 or so data processing staff.

Things have changed since then. Derek Warren, manager of computer services at Thomas Cook, says: "We never seem to have any problems in getting computer staff. As a compay we are involved in some of the more exciting DP developments and I think our business draws well, because travel is an exciting industry.

"But having said that, the facilities in the town do make it easier for us." Thomas Cook has about 120 DP staff.

"The growing number of installations in Peterborough means there is quite a good labour pool, though it works both ways, because we lose people as well. But I think it's good that other companies are coming in; it's healthy for us all.

"Our staff turnover has never gone up unduly, but it would be wrong if there wasn't a turnover."

Warren is himself a proof of the Silicon Fen argument. He is part of the "old guard" of the Peterborough computer industry. He was born and bred in Peterborough and moved into the travel business when Thomas Cook moved into the town. Before that he was with one of the established Peterborough computing concerns, Geest

WAINRIGHT . . . "The hype is being checked."

Computer Services.

Geest originally set up in nearby Spalding in 1966 to do data processing for the Geest company, which at that stage was best known for bulbs and bananas. Geest recognised the market for bureau services and set up its computing arm as a separate division.

The company moved to Peterborough in 1972 for two reasons. Director Les O'Reilly says: "Most of our customers were in Peterborough anyway and with the Peterborough Development Corporation underway we foresaw a growth in the market."

While Peterborough did turn out to be a good area for business, the growth aspect worked both ways. "Whenever a new company comes to the area, you get a tremendous ripple. This is because it is new and can offer London rates. I suppose most firms in the area suffer from rippling effects," says O'Reilly.

"We have lost some staff, but we have also come to accept that this will happen.

"On the other hand, the type of people we employ at Geest need to have wide experience, so new companies bringing new people into the area can also work to our advantage."

Geest is now furthering the development of Peterborough's computer segment with a move to micros. The company is opening a business micro retail store in the town later this month.

The shop is the brainchild of Philip Wainwright, managing director of Geest. "There isn't a micro shop for business users anywhere in the area, so I think the market is there," he says.

"For the past two to three years people have been talking about micros as if they will satisfy every business need, they've been oversold tremendously. The reason why it now seems to be a good time to get into micros is that there's some sense coming back to the marketplace and the hype is being checked.

"Everyone is realising that although the hardware is cheap, you do have to consider maintenance and training and such like things. That's the area Geest will go for, so we won't necessarily be the cheapest in the market."

Wainwright emphasises that going into micros doesn't mean Geest is deserting the bureau business. "Really the main aim is to sell micros to link back to the bureau and use the shop as a way of getting business.

"In fact, we've been selling standalone micros since last year and we've sold 70-80 from our existing office. But it's not ideal, because we qualify our customers

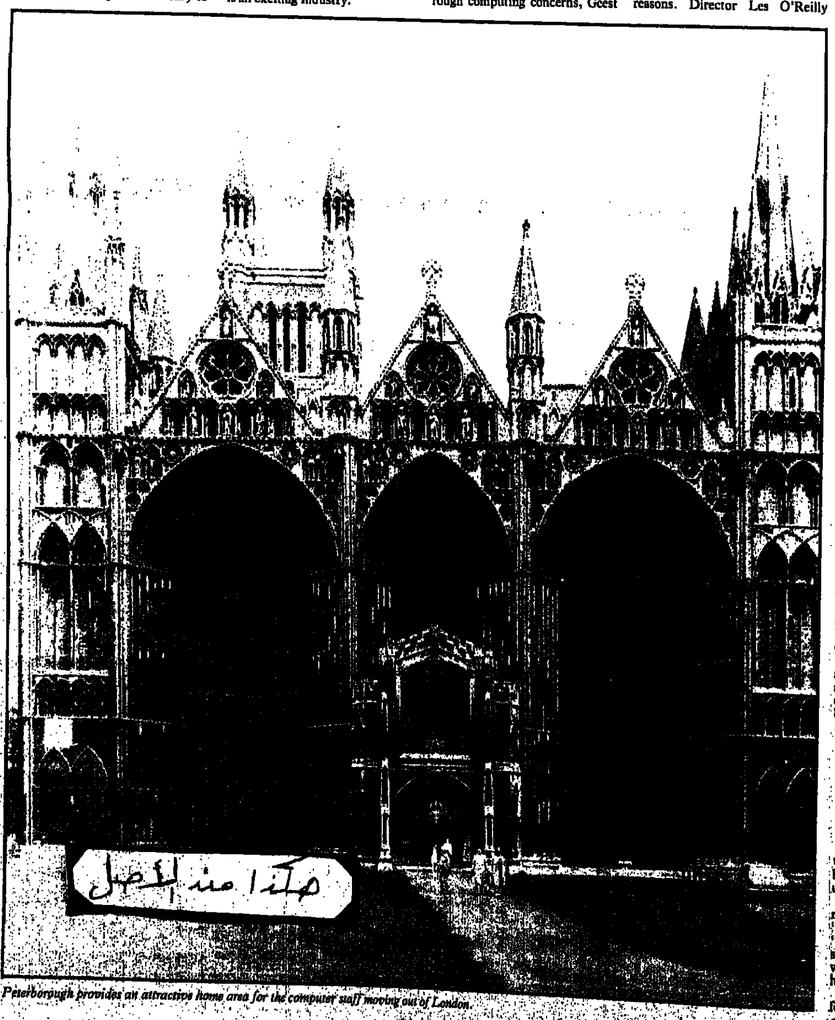
While older companies may eschew the Peterborough effect, some of the new ones are enthusiastic

by the problem they have finding us."

Having a town centre site should mean that customers just drop in. "After all," says Wainwright, "two or three visits from a salesman and you've practically wiped out any profits you might have made.

"I think the shop will be a focus for computing supplies for 30-40

■ Continued opposite



Peterborough provides an attractive home area for the computer staff moving out of London.

Peterborough pulls in the businesses

■ From page 30

miles radius, and there are 20,000 businesses in that area."

Setting up the shop has cost Geest between £50,000 and £70,000. "I'm sure it will be worth it," claims Wainwright. "When you look around Peterborough, for a relatively small town it has become a focus of considerable computer technology, so there will be a demand."

There is one computer company in the town that goes back further than Geest Computer Services, one where Wainwright himself worked in its early days. Peterborough Software has been around for about 20 years and, as managing director John Mills points out,

Peterborough Software: "We are aiming to establish our own identity in our own place"

"20-year-old software houses are few and far between".

The company specialises in manpower packages. It is a market leader in its field and its customers tend to be of the large variety.

At the moment Peterborough Software has its offices spread over three sites. It has just been given planning permission for £3 million worth of new offices in the grounds of Thorpe Hall, a Cromwellian mansion in the area.

Mills says: "What we are aiming at is to establish our own identity in our own place. Work will start this April and we expect to move in at the beginning of 1986.

"The building will be exclusive, in a nice area, but only five minutes from the town. The premises will show us as a significant force in our industry. They will also provide a better environment for us to work in."

Mills does not think that Peterborough's new town status has contributed to the success of its namesake. "We've grown because of growth in the computer industry, not because of the Peterborough Development Corporation. There's no factor in our success which I would attribute to being in Peterborough.

"Peterborough Software is in one of the industries that doesn't rely on massive capital expenditure. We could be anywhere with good roads and telecommunications. We would have done the same amount of business no matter where we were.

"The development corporation's main achievement is that it has changed the profile of the town. Because it has brought in middle management people, it has increased spending power and generated a demand for services.

"This has no effect on Peterborough Software because 99% of our business is outside the town."

Another of the established companies in the town does not see the corporation as a factor in its fortunes. Baker Perkins is part of the backbone of the traditional engineering industry in the town. It has made a successful transition from mechanical to electronic engineering in its business of designing and manufacturing printing presses and process equipment for the bakery and confectionery industries.

Sally Holmes, Baker Perkins personnel manager, says: "We've changed from being a local employer and we're now recruiting at graduate level on a national basis. The sort of skills we're after are scarce, but people come to work here because of the type of jobs we offer, not because of Peterborough."

While the older and more established companies may eschew the Peterborough effect, some of the new ones are frankly enthusiastic about it. One company that demonstrates how things can rub off is Tourism Technology Limited.

This software house, which caters for the travel trade, was set up at the end of 1982 by Dave Adams, who before that spent 20 years working for Thomas Cook. He moved to Peterborough when Thomas Cook relocated there.

Tourism Technology was set up to develop Modulas, an office management system for travel agents. "My immediate thought when I was asked to do it was to go back to London because the various parties involved were based there. But the choice was up to me and I decided Peterborough would be cheaper."

Adams started off in two rooms in an office block built by the Peterborough Development Corporation and has expanded to five. The original staff complement was three and this is expected to reach nine by April.

Integrated Vision is another of the companies which have started up in the area, set up by someone from another Peterborough firm.

The company is selling a two-dimensional draughting system based on the Sage 4 micro. It does turnkey systems and is happy just to sell the software, which it is continuing to embellish.

Mike O'Brian, managing director of Integrated Vision, says: "I'd just been made redundant by Perkins Diesel and was looking for a new opportunity when I heard about the system, which was being developed at Teeside Polytechnic. I went to look at it and liked it, but

Geest Computer Services: "Whenever a new company comes to the area, you get a tremendous ripple"

didn't fancy going to Teesside to set up the company and face another upheaval so soon after being made redundant.

"I had a chat with the two people doing the development and they came to Peterborough, liked it and decided to move down. The development corporation was very good and helped them find somewhere to live. If we couldn't have got the people down, we wouldn't be in business.

"We could also be well-placed in Peterborough, because the engineering industry in the town provides a ready-made market."

Integrated Vision also looks set to interact with another high tech firm that started up in Peterborough – they might be doing business with each other. Mesh Data is a broadband network design company with offices in the same building as O'Brian. As well as designing networks the company performs all commissioning and testing on broadband cable systems and also manages networks on behalf of clients.

The firm was founded in 1982 by Nigel Squibb. Squibb had just spent five years working for 3M in Germany and recognised that the UK market in local area networks was just about to take off.

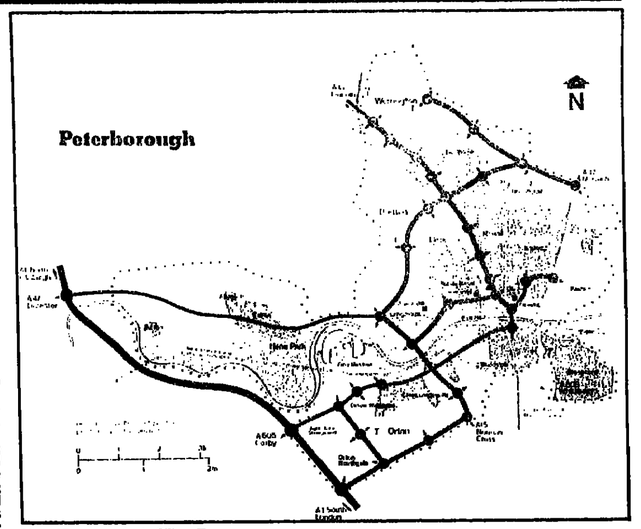
"I came to Peterborough because I didn't have that much money and I was stunned at the cheapness of houses," he says.

"We're now moving into manufacturing, and our first product, an advanced broadband modem for point-to-point applications, will be available soon from Network Technology, the distributor.

"We've subcontracted the making of the boards to a local firm. There was no choice of subcontractor as there would have been in the M4 corridor, but then it was half the price."

There is now quite a mix of different computer companies and users in Peterborough.

The industry in the area is big enough to spark off ideas and support new ventures. On the other hand, it has not got so big that the informal networks fall over. And some of the small firms starting up in the area demonstrate the importance of this synergy.



Map of Peterborough: the Silicon Fen.

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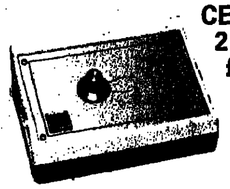

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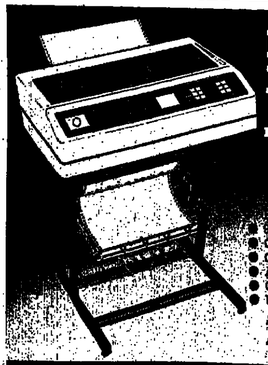

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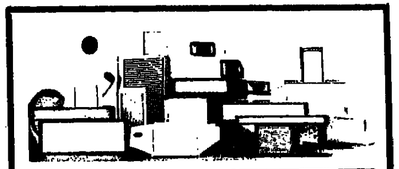

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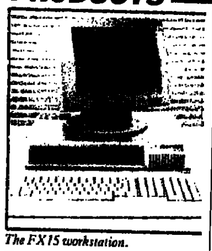


The FX15 workstation.

Workstation of Future

IN a move to grab 10% of the workstation market Future Computers announces its new FX15 which has the same specification as the 16-bit FX20 microcomputer but with one floppy disc drive.

A terminal with its own disc drive means the terminal user can have local storage on its 5¼in. floppy at a low cost while using the storage in the FX30 for its main work load.

The Future range is designed and built in Britain.

Future Computers (CW), PO Box 306, Purley, Surrey. Tel: 01-683 0111.

Multiplexer options cut comms costs

RACAL-MILGO announces two major enhancements to the Omnimux range of statistical multiplexers with the addition of a dual aggregate option and two integral modems.

The dual aggregate option provides two instead of one aggregate data streams at a cost substantially less than that of two separate multiplexers, says Racal-Milgo. Equipped with the dual aggregate option, the Omnimux 320, for example, is now capable of concentrating 32 channels into two aggregate data streams at speeds from 1200 to 9600 bit/s.

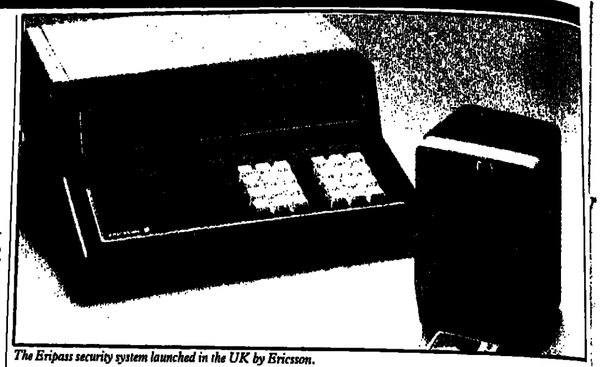
Users have the choice of three operating modes. In load sharing configuration, an Omnimux link equipped with dual aggregate will optimise user response time by transmitting data over the less loaded of the two lines. Should one of the links fail, all traffic is automatically switched to the remaining link. When the line is restored, normal load sharing is automatically resumed.

In split link configuration, one central site Omnimux fitted with the dual aggregate option can support two remote multiplexers, providing a saving in cost and space. Further saving is possible should it be necessary for the two remote sites to communicate with each other.

In split link mode, the remote modems are able to communicate with each other via the dual aggregate central site Omnimux.

Two integral modems are available, giving the user a choice of 2,400 and 4,800 bit/s transmission speeds.

Racal-Milgo (CW), Landata House, Station Road, Hook, Hants RG27 9JF. Tel: (0734) 782158.



The Eripass security system launched in the UK by Ericsson.

Ericcson joins UK security market

WITH the launch of a new access control system, Ericsson Information Systems has entered the UK security market.

Its new Eripass system comprises two basic hardware units, a combined card reader and keypad operated door lock terminal and a central control unit.

The card reading terminal is self-contained, and uses a unique encryption algorithm to validate a personal identification number entered on the keypad against a magnetically encoded card number. It does this without reference to a computer based master list, and is fast in operation and secure against electronic or physical vandalism.

In addition, each terminal can be programmed for up to four different security levels at different times of the day, says Ericsson.

When used as a total site security system, up to 32 terminals can be connected by means of twisted pair wiring to a single Eripass central control unit. The latter can be programmed to define up to 64 different authorisation levels.

Ericsson Information Systems (CW), 7 Gresham Street, London EC2V 7BX. Tel: 01-606 0425.

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Hawke Electronics Limited, Amotex House, 48 Hanworth Road, Sunbury-on-Thames, Middx. Tel: 01-979 7799

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System designed for first-time users

COMPUTER Systems and Products has launched a complete computer system – hardware and software – for small businesses. Known as Micas, it is based on the new Digital Equipment Micro/PDP-11 and costs from £9,950.

Micas – Micro Integrated Commercial Accounting System – provides first-time users and accountants in small businesses with a ledger and management information system.

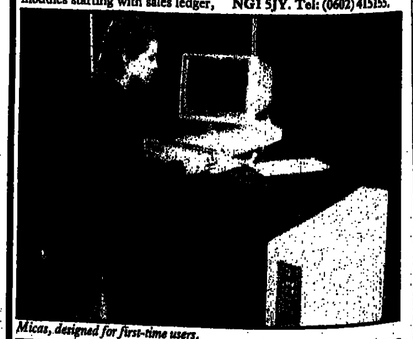
It enables users to monitor the processing of sale, purchase and nominal transactions from the input of an invoice, credit note, etc to the production of a full trial balance and comprehensive month end management reports.

The base Micas system provides a set of fully integrated software modules starting with sales ledger, purchase ledger, and nominal ledger, each of which can be operated independently of the other two. The system also provides a wide range of monthly management accounts including budget comparisons and numerous management reports.

The system can be expanded to handle a much wider range of functions with modules already available to cover sales order processing, payroll, etc.

Due to the modular design and the system's ability to operate modules independently, users can phase the implementation of Micas by purchasing each module separately or in conjunction with either of, or both of, the other two.

Computer Systems and Products (CW), Barrasford House, Goldsmith Street, Nottingham NG1 5JY. Tel: (0602) 415155.



Micas, designed for first-time users.

UK colour terminal

MICROCOLOUR Graphics has launched a colour terminal, the M2080, at an end user price of £995. This VT100 and VT131 compatible terminal is of British manufacture and competes with mono terminals which commonly fall in the price bracket of £750-£1,000.

The M2080 offers 40 and 80 column options and is also fully viewdata compatible. Full modem control is a standard feature and a range of printers can be supported.

Microcolour Graphics (CW), 11 Futures Way, Bolling Road, Bradford BD4 7TU. Tel: (0274) 727274.

Winchester controller

A WINCHESTER disk controller is now available from Dilog distributors for use with DEC LSI-11 microcomputers.

The Model DQ634 provides RLOI emulation for RT-11, RSX-11, RSTS, Unix or other LSI-11 operating systems.

Features built into this dedicated controller include 22-bit addressing for two-megaword access, and enhanced 32-bit ECC with a 32-bit checkword to prevent data errors.

Dilog International (CW), 11 Temple Square, Aylesbury, Bucks HP20 2QL. Tel: (0296) 84101.

PRODUCTS

A terminal for telex rooms, featuring automatic transfer of typescript to telex message.

From typescript to telex

A TERMINAL for telex rooms featuring automatic transfer of typescript to telex message has been developed by AEG-Telefunken. It consists of a typesheet reader, a VDU-terminal with keyboard and a tape puncher.

In the past, text was typed on a typewriter and delivered on standard forms to the usually centralised telex room. There they would be retyped to generate a punched tape, which was then sent out without idling periods. With the new terminal the time-consuming process of punching tape can be cut to a few seconds.

As usual the texts may be typed on red forms, which may include further data at the margin or head like cost item, author, copies to, signature, etc. These data, not part of the actual telex, as well as corrections, are typed in red. This colour is "ignored" by the typesheet reader.

The telex head may also be typed in black. In this case the sheet reader is adjusted so that it will start reading only at a certain distance from the upper sheet rim, ignoring the heading part. When the typescript form is inserted into the reader, the telex text is read within 20 seconds and displayed on the VDU by pressing a key.

Now corrections may be inserted, but special characters like %, $, as well as Umlauts are automatically transcribed into normal lettering. If this causes excess of characters in one line, the text overflow is automatically transposed to the next line.

AEG-Telefunken, Offenflichkeitsarbeit, Theodor-Stern-Kai 1, D-6000 Frankfurt 70. Tel.: (0611) 600-35 74.

Apple adds value to its range

APPLE Computer (UK) has introduced five specially packaged systems based around its IIe and III personal computers. The system range from an Apple IIe 64K starter system, priced at £1,199 up to an Apple III Profile System priced at £3,495.

Apple also announces that it will be distributing the MicroSci 572K drive as the preferred back-up system to the Apple ProFile hard-disc unit.

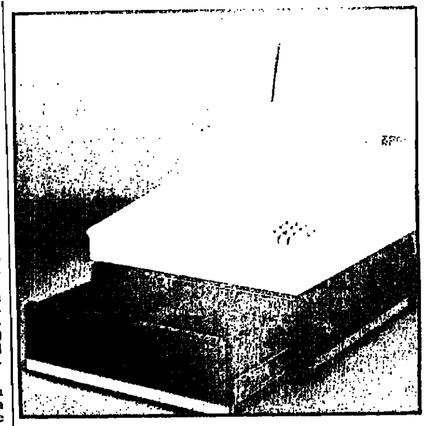
The starter system includes a 64K Apple IIe processor and keyboard, one disc drive with controller, the new Monitor II and an 80 column card. This system would normally retail at £1,419 so represents a substantial saving.

The 128K small business system has been designed to provide a more powerful alternative to the starter system. It includes the Apple IIe, two disc drives with controller, Monitor 11 and a dot matrix printer. Also included is an 80 column extender card. The price of £1,970 is again a substantial saving on the normal recommended retail price of £2,288.

Three specially packaged systems have been introduced for the 256K Apple III. In addition to the £2,345 basic Apple III system, which includes an Apple III, Monitor 111, and System (SOS) with Apple 11 Emulation, Apple has designed two further specialised packages for business management.

The Apple III Word Processing System which includes AppleWriter III and a letter quality printer as part of the package costs £3,495.

Apple Computer (UK) (CW), Eastman Way, Hemel Hempstead. Tel: (0442) 60244.



Combining the functions of a cash register with a terminal.

Cash register acts as a terminal

DTI's latest emulation terminal combines the functions of a standard cash register with those of a terminal interfacing with a host computer.

To the operator and the customer, the DTI cash terminal acts as a standard cash till recording details of sales made, the cost of sales, the payment made, the change given and the issue of a receipt.

At the same time the terminal is giving this information to the host computer so both stock records and sales records are updated as a sale is made.

On a number of occasions over the last year DTI says it has been asked for terminals for point-of-sale operations, and it has been obvious that while simple terminals are required, a standard terminal is not only confusing to the operator but impractical for point of sale operation.

With this in mind DTI designed a cash terminal which incorporates the DTI Emulator logic board.

DTI Europe (CW), 10 Cronin Courtyard, Corby, Northants, NN18 8AY. Tel: (0536) 201152.

Lamp sheds light on life insurance

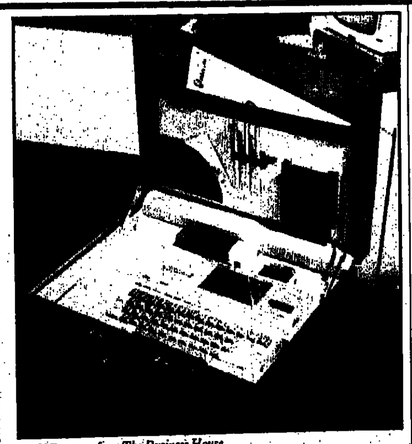
INSURANCE salespeople, it is claimed, can provide accurate and detailed quotations in minutes to clients requiring life insurance with a portable computer package developed by The Business House.

In consultation with Abbey Life, The Business House developed LAMP (Life Assurance Marketing Program) specifically for the Abbey Life sales team and its products, all details of which have been programmed into the system.

The system is based on the Epson HX-20 which has its own screen, printer, micro-cassette and keyboard and a battery life of 50 hours before it needs recharging. The Business House has packaged the system into a leather briefcase.

Now Abbey Life salesmen can show a client how much he needs to be insured for and how much it will cost. At the same time LAMP calculates the cash-in value of any policy for every single year until its maturity and illustrates this to a client by a printout.

Previously insurance salesmen used a rate book, and while this new system does not replace the rate book it offers a more reliable and sophisticated alternative to thumbing through a book to quote



LAMP system from The Business House.

premiums, sums assured and cash-in values, says The Business House.

Said Ray Blackman, partner of The Business House: "Coming from a sales background, I saw the Epson HX-20 as a shining light with tremendous potential for giving support to field personnel and their clients. When I approached Abbey Life's marketing people they were of the same mind. We have worked together to produce a major breakthrough."

The Business House (CW), 47 The Promenade, Cheltenham, Gloucestershire GL50 1PJ. Tel: (0242) 517955.

16 colours available at once

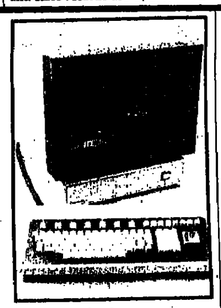
GENISCO Computers' G-2050 interactive graphics controller is a low-cost, colour raster graphics system capable of operating with a variety of standard high resolution monitors.

The G-2050 has a viewable resolution of 1024 by 792 pixels, with a 60Hz frame rate. Sixteen colours are simultaneously available from a total palette of 4096 hues.

Communications with a host computer can take place with a standard RS232 (to 38.4K baud) or high-speed RS422 (to 100K baud) serial link. The G-2050 operates with a keyboard, joystick, mouse, graph tablet and colour or monochrome hard copy device.

The G-2050 uses a structured system design and VLSI devices to achieve a level of performance previously available only in more complex graphics systems, says Genisco. The single board intelligent graphics module has two processors, a 16-bit supervisor microprocessor, and dual graphics display controllers.

Additional circuitry includes four planes of refresh memory (each 1024 × 1024 bits), three intelligent communication controller



The Genisco G2050.

ICs, video look-up tables and digital to analogue converters for red, green and blue outputs, as well as the control logic necessary to integrate the whole system.

The hardware design produces such features as the integer zoom, colour control, memory plane gating and overlay selection.

The Tektronix 4014 code compatible operating system resides in 32 Kbytes of on-board EPROM. Other graphics commands are included which allow full use of the powerful hardware features.

Genisco Computers (CW), 7 Notre Dame Mews, Northampton NN1 2BG. Tel: (0604) 24621.

Direct digital switching for Harris' D1200 family

HARRIS Digital Telephone Systems has launched a direct digital data switching facility for its D1200 family of 100 to 7000 line PABXs. The cost is under £500 per line.

Using a two-pair interface, direct data transmissions are made possible between the D1200 PABX and computers, terminals, peripherals as well as other PABX lines, without using modems.

Users enter the desired extension number via the terminal keyboard, and data is transmitted from port to port in digital format and with automatic baud rate selection between 110 and 9600 bits per second.

The new feature, says Harris, will provide users with a cost-effective solution to the problem of inter-office switching of PABX lines and for interconnection with existing computer installations, DDP, PC and WP terminals as well as with local area networks for combined voice and data transmissions.

The data transmission capability makes use of a line driver box – free standing or rack mounted – but located near each terminal. This unit extends the transmission distance up to 4,000 feet, well exceeding the standard RS232 cable limit of 50 feet. The interface between the driver and the Harris D1200 requires only a two-pair line with no special system wiring.

Data cards in the PABX occupy two time-slots and accommodate up to four devices each. All "calling protocols" including confirmations and line-busy screen messages, are handled automatically by the system. Request "calls" are directly keyed.

Harris Digital Telephone Systems Division, 153 Farnham Road, Slough, Berks. Tel: (0753) 34666.

Boost for telex users

HERMES' Top-tronic models 21, Super 40 and 51 can now be equipped with an interface allowing them to be coupled to a telephone modem or acoustic coupler for rapid text and data transmission between similar machines.

An advantage for existing telex users is that these models can be linked to a telex punch.

Hermes Precisa (UK) (CW), Hermes House, Ipswich Road, Colchester. Tel: (0206) 845251.

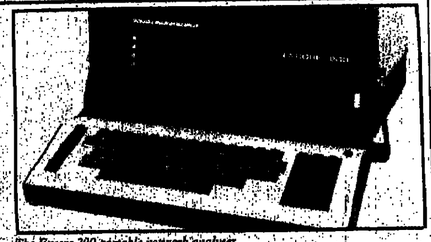
Alpha gives an Encore

THE portable Encore 200 from Alpha Datasystems now has the ability to provide network information in many different protocols such as X.25, SLDC/SNA, bisync, etc, and will operate at speeds up to 64 kps. This network analysis capability provides real time screen display of information such as response time, line utilisation, message types and error performance.

The ability to operate in a multi-drop environment and produce separate statistics for each device on the network are standard on the Encore, as is its ability to produce full printouts as management reports or download the information to another computer for further analysis or storage.

Other recent enhancements to the Encore include capabilities to work with X.21 networks such as kilostream or other digital data networks.

Alpha Datasystems (CW), Alpha House, Batford Mill, Harpenden, Herts AL5 5BZ. Tel: (058 27) 66136.



The Encore 200 portable network analyser.

New range of disc sub-systems announced

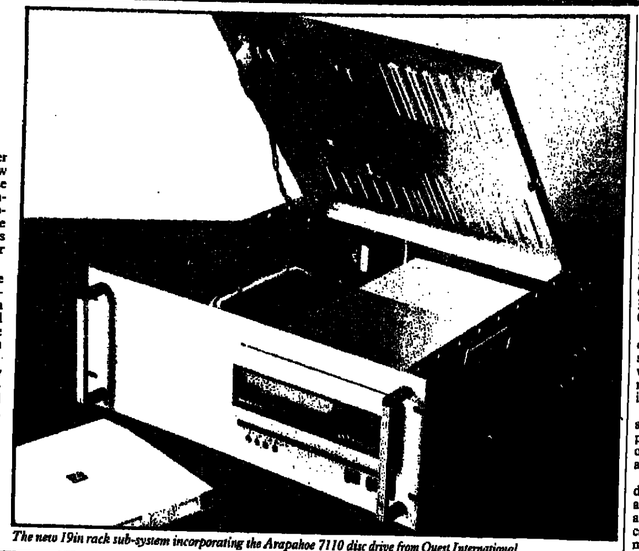
QUEST International Computer Equipment has developed a new range of disc sub-systems, for use with leading mini and microcomputer systems. The 19in. rack sub-system is based on the Amcodyne Arrapahoe 7110 disc drive, which is also available as a single unit for OEMs and end users.

The Arapahoe is an 8in. drive providing 53.2 Mbytes of unformatted storage capacity, with a combination of 26.6 Mbytes fixed and 26.6 Mbytes on a removable Ansi standard cartridge. It has a 30ms average access time.

The drive incorporates Whitney technology, which features advanced head suspension and read/write technologies derived from the new generation of mainframe disc drives.

A microprocessor-controlled-/embedded servo system ensures maximum head to disc alignment.

Quest International Computers (CW), School Lane, Chandler's Ford, Hampshire SO5 3YY. Tel: (04215) 66321.



The new 19in rack sub-system incorporating the Arapahoe 7110 disc drive from Quest International.

A manager to keep track of phone bills

MORE precise control over business telephone usage and costs in now available with TeleManager One, a new concept in telephone call accounting for switchboards of 30 to 500 lines from Interscan Communications Systems.

TeleManager One is a third generation system which gives instantly, upon demand and on site, what are claimed to be the clearest management reports available in its price range.

It plugs directly into the switchboard. Call information is processed to give both a detailed overall picture of telephone costs, and invididual analyses.

Reports can identify volume, duration and costs of calls, and also highlight problem areas such as phone abuse or overuse. They can summarise costs by department, extension or number called.

Analyses can also point out ways to improve a telephone network's efficiency, for example whether more or fewer extensions or a private circuit are advisable.

TeleManger One can achieve annual savings of up to 30% in the telephone bill, through better network planning and a reduction in dialled units, says Interscan.

A client billing facility enables users to allocate telephone costs precisely to specific jobs, cost centres or customers. The system can be programmed to print reports regularly at a given time, for example every week, every month, or every quarter, at the same time as details of calls are being stored.

A battery back-up option guards against loss of data in the event of power failure.

TeleManager One retails from £3,250, or is available on rental or lease purchase options.

Interscan Communications Systems (CW), 39 Montrose Avenue, Slough, Berks. SL1 6BS. Tel: (0753) 70821.

TeleManager One.

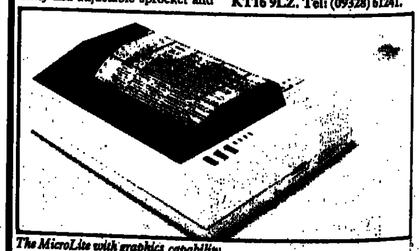
Printer with graphics

MICRO-LITE 80 is a serial impact dot matrix printer designed for the microcomputer market, offered at a lower price than the present industry standard.

Operating at 80chps (text mode), Longs Micro-Lite 80 features a full 96 ASCII character set including semi-graphic and international characters, graphics capability and adjustable sprocket and friction paper feed. All operations can be modified under software control and the printer can be interfaced to most leading makes of microcomputer.

Micro-Lite 80 weighs 5.3kg with dimensions of 377mm×295mm×125mm high.

Longs (CW), Hanworth Lane Trading Estate, Chertsey, Surrey KT16 9LZ. Tel: (09328) 61241.



The MicroLite with graphics capability.

PC transfer package

AN application software package allowing users of Ultimate computers to emulate an IBM-PC, transferring files between each, is available from Universal Computers Ltd (UCL), at £420 (or £10 a month rental). The package, SmarTerm/PC, can be used on both Ultimate Honeywell-based machines and DEC-based equipment.

SmarTerm/PC runs on the IBM-PC and operates in conjunction with the standard IBM asynchronous communication adapter, allowing the personal computer to emulate a DEC VT100 terminal. The PC will then be able to communicate with the Ultimate computer, running the Ultimate operating system via standard asynchronous protocol.

UCL (CW), 23 Paradise Street, Lonsdale SR16 4QD. Tel: 01-232 1155.

Daro adds a disc drive

DARO Typewriters (UK) has added a further option to its Serd 2000 electronic typewriter. It now offers a full off-line text editing disc drive method of storage and display which incorporates 160K 5¼in. diskettes.

The Serd ScreenSystem disc drive is available with either single or twin disc drive software and can be added to any existing ScreenSystem which has 32K+ memory. It can also be added to most Adler, Imperial or Triumph electronic typewriters.

The disc drive version of the ScreenSystem incorporates Mail Merge, which allows variable information, such as names and addresses from one file, to be automatically merged with information contained in another file.

Daro Typewriters (UK) (CW), Lait International House, Old Station Road, Loughton, Essex. Tel: 01-502 0115.

Personal Computers from Fujitsu. Japan's Leading Computer Manufacturer.

The name is Fujitsu. If you've never heard of it, don't worry. Not many people here have. But they will.

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Now Fujitsu are coming to Britain. Bringing a range of personal computers - the Fujitsu Micro 7 and Fujitsu Micro 16s. Both are unequalled, in quality or in price, because Fujitsu make all their components themselves.

Both offer user facilities that start with stand alone, low cost systems, building into powerful multi-user combinations. And both run industry-standard operating systems and application packages, so there is a wealth of software available.

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And it's a name that's going to be around for a long time. You can rely on it.

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(IBM MVS/JES ASSEMBLER)

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As a member of a team whose mandate includes marketing support and installation of full scale systems, your principal role will be to support the linkage between Control Data Supercomputers and IBM MVS/JES1 mainframes. This will include the support of existing customers, software enhancements and the development and presentation of proposals to prospective customers.

Ideally qualified to degree level, applicants should have experience in the following:

* **ASSEMBLER and high level languages**
* **IBM MVS/JES2 or JES3**
* **Network protocols (an advantage)**

A high degree of self-motivation and the ability to work to strict deadlines is essential.

An initial training course of three months will be given in Minnesota, U.S.A.

A large proportion of your time will be spent at customer installations and therefore UK and occasional overseas travel will be necessary.

Depending on experience a company car may be provided.

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* **Development of on-line database systems**
* **Liaison with users in defining business requirements and systems implementation**
* **Technical Design**

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User Support Programmer

(DEC Systems)

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Our client's principal business activities are mineral exploration and mining.

The Data Processing department provides vital information services in the areas of Communications, Word Processing, Financial Modelling and Reporting, Graphics, Viewdata and Accounting systems.

Utilising a wide range of DEC hardware, the User Support Programmer will be a key member of a small team engaged in a variety of interesting activities. These include implementing and supporting new releases of operating systems, languages and communications software and assisting users in the usage of modelling languages for developing and enhancing new systems.

Candidates with at least 3 years DP experience should be able to demonstrate expertise in some of the following:

* **Financial applications**
* **DEC hardware/software**
* **Fortran or EPS**
* **Operating systems implementation**
* **Networks/Communications**
* **User liaison skills**
* **Basic and/or COBOL an advantage**

The successful candidate will be offered a competitive salary together with a comprehensive benefits package.

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Knight — Confidential Reply

Data Processing Manager

ICL System 25 – Looking for a new challenge?

Greenwich, London — **£ Negotiable plus concessionary mortgage**

Greenwich Building Society retains a competitive and innovative position in the market place and is soundly based with assets of £700 million. The Head Office is located at Greenwich with a number of branches based in S.E. London, Kent and Essex.

The Data Processing department comprises two ICL System 25's (one dedicated to program development) with remote communications supporting sixteen VDU stations and eight printers on-line.

The Data Processing Manager will take responsibility for the day to day running of the department and the management of three Computer Operators. There are a variety of interesting developments planned and these include COM, BACS, an Investment Portfolio system and a Mortgage Application system. In addition, the successful candidate will maintain and enhance existing software.

Applicants should be able to demonstrate management skills with ASSEMBLER programming experience gained on System 10 or System 25 hardware.

Excellent career prospects will be presented to the right person together with the following benefits:

* **Concessionary Mortgage (currently 4%)**
* **BUPA**
* **Relocation assistance**

For further information, contact Knight on 01-491 4706 quoting Ref TD 200.

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(Manufacturing Systems)

London & Essex — **up to £11,000**

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An Analyst/Programmer is required to undertake a long term assignment at a client installation, initially based in London but later in South Essex. The individual will be a member of a project team developing an Integrated Production and Management Control System for this major manufacturing company.

The system under development will be based on a DEC VAX 750 configuration operating under VMS with the main application programs written using COBOL.

The applicants should therefore have sound programming experience with a minimum of 2 years COBOL, preferably gained in a DEC VAX environment. Fortran experience would be an added asset.

The career opportunities within Unilever Computer Services Limited are excellent and the successful candidate can expect an interesting and stimulating future.

Find out more – contact Knight on 01-491 4706 quoting ref YY604.

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They are now seeking additional PL1 Programmers to play a major part in this challenging development area with involvement in all levels of System activity working in a project team environment.

Candidates should have at least twelve months programming experience in PL1. A knowledge of IMS, DL1 or CICS is an advantage although training will be given to the successful candidates.

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THE PROGRAMMING STORY BEHIND THE FRONT PAGE NEWS

The news is all from Morgan-Grampian plc., a major publishing house responsible for 50 important titles, many of them required reading for people concerned with the advances of high technology in business and industry.

With the installation of a large new IBM system 38 configuration at our Head Office in Woolwich by leased line to an IBM 3083 connected at Croydon, we're now ready to take on the exceptionally bright, people-orientated Programmers who will write the synopsis for our future growth – in RPG and COBOL – and do much more besides. There will be opportunities for writing systems using micros, minicomputers and mainframe in a multi site environment.

IBM 38 experience is not a requirement – we can provide all the training you'll need to use our advanced equipment to develop – then expand – a complete range of software systems. Everything to support exciting developments.

What we want from you is a minimum of 2-3 years' good programming experience and ability to liaise well with people in every area of our business from editorial chairs to finance and media sales.

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(8336)

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At British Gas London Computing Centre we are working on a challenging range of projects, developing systems to cover wide areas of our business: Major Project Scheduling, Stock Control, Engineering, Management, Finance and Accounting, Large Contracts and Personnel.

We are now looking for DP people to join our professional team in Fulham.

Analyst Programmers — up to £13,452

With the ability to develop programmes through all stages, analysis, design, programme development and system implementation. Background: at least 3 years in a mainframe commercial environment, and practical experience in COBOL and mainframe job control language. Ref EP/76400 [147].

Programmers — up to £10,520

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The tools of our trade? We work on an ICL 2900 VME using structured techniques, COBOL and programmer productivity tools. There's a Univac 1100/61 on site plus access to a large IBM mainframe. The use of database is well-established and we are now moving into networking and distributed processing. We operate under ROSCOE and RPF procedures, with MVS and JES2. Training will be given where necessary.

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BRITISH GAS

Head of MVS Systems Support

The Rutherford Appleton Laboratory, part of the Science and Engineering Research Council, supports scientific researchers in universities and polytechnics throughout the UK. The Computing Division provides large scale computing services and coordinates computing research programmes. There is a large IBM-compatible mainframe complex, and a large number of distributed computers.

There is a vacancy for a head of MVS support, who will take responsibility for maintenance of MVS/JES3 operating systems both on the scientific (IBM 3081 and ICL Atlas 10) and administrative (IBM 3032) systems. This will involve applying updates, solving problems, reporting bugs to the manufacturer, reconfiguring and tuning, establishing operational procedures, etc. The post is in Computer Services Group but there is a need for liaison with the users and development groups as required.

The post is at the following grade:
Senior Scientific Officer £8,970-£11,476 p.a.

Some assistance with expenses incurred in house sale/purchase may be available.

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Application forms from: Recruitment Office, Rutherford Appleton Laboratory, Science and Engineering Research Council, Chilton, Didcot, Oxon OX11 0QX. Tel: Abingdon (0235) 445435, quoting ref. VN 209.

Closing date: 5th April 1984

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MANAGEMENT & EXECUTIVE SELECTION

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Our client is a highly successful U.K. based manufacturer and supplier of computer systems, with a reputation for high quality products and an excellent back-up service.

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Our client therefore wishes to appoint a number of lecturers who have expertise in one or more of the following areas:

- A thorough knowledge of COBOL (preferably on DEC based equipment).
- Systems Analysis and Design from Feasibility to Implementation.
- Structured Programming/Analysis.

Naturally, you will be articulate, self-confident, and resourceful, and preferably have previous experience. Training in course design and 'trainer skills' will be provided as necessary.

In return for your highly developed skills our client offers an attractive salary with company and departmental bonus schemes plus a range of usual big company benefits.

Our client wishes to make these appointments without delay so please write with full C.V. as soon as possible to: Mr G Green.

Nightingale Executive
103, The Parade, Swinton, Manchester M27 2BJ.

Companies to which you do not wish your application to be forwarded should be listed in a covering letter.

da123

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Analyst/Programmers
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- IMS and ADF is essential

Systems Programmers
4 years + supporting MVS/JES2 and/ or IMS/VS, TSO internals, VTAM, SNA design and MVS structure and design.

IBM Programmers
- PL1, Fortran
- Mark IV (an advantage)
- Scientific applications (an advantage)

Training Instructors
- PL1 and/or Fortran
- VM/CMS and/or TSO/SPF

Analyst/Programmers
To convert mainframe applications to run on a personnel computer hardware.
- PL1, MVS JCL, EXTENDED SPF, MARK IV
- Micro networking experience (UNIX an advantage)

Systems Analysts/ Systems Programmers
Candidates should either have a B.Sc Engineering qualification with at least 4 years DP experience or 7 years related job expeience with 2 years as an Analyst. Experience in PL1 programming is essential and ISPF is preferred with sound knowledge of some of the following:

SPF, OS, JCL, TSO, Project Development Methodology, Panvalet Program Management, IBM Utilities, Flow Charting – Data Flow Diagrams, ISPF Dialogue Manager, Structured Programming Techniques, Documentation Writing.

The ability to liaise with users to define maintenance and development projects through to implementation with minimal supervision is essential.

Systems Analysts – Training
Training experience is PL1, Fortran, TSO/SPF, CMS in an IBM environment operating under MVS/JES2 and/or VM.

In addition a sound knowledge of the oil industry and the ability to communicate effectively is essential.

Systems Analysts
Candidates should either be degree qualified with 5 years IBM DP experience or a minimum of 8 years in an IBM environment.

A sound knowledge of MVS, VM, SAS, TSO/SPF, PL1 and/or Fortran is desirable. Previous experience either as an Instructor or working as a member of a project team is an advantage.

Training Instructor
- DEC/VAX experience in sufficient depth to be able to train personnel in applications.

VAX Systems Programmer
- Hardware installation
- Software development and applications
- Network systems

Systems Engineers
WANG installation and provision of hardware/software support. IBM SNA interface with WANG.

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To provide consulting services in the applications of Information Technology.
- Degree in Computer Science, Telecoms or Business Administration
- Knowledge of IBM, WANG, DEC product line
- Background in Project Management

Systems Analysts – Office Systems
- 5 years + experience in Office Systems
- Knowledge of IBM, WANG, DEC applications
- Recent experience in control of Office Systems particularly Word Processing, DP or micro systems

Senior Analysts – Strategic Planning
- Experience of long range planning
- Risk/Benefit Analysis
- BSP
- Mini/micro business applications (an advantage)

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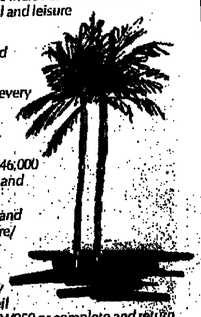
- *Working for a multinational and utilising the latest in hardware/ software technology*



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Contract (IBM — London)

Op System	*Position*	*Package*	*Language*
DOS/VSE	Prog	DLI ± CICS	COBOL
DOS/MVS (Conversion)	Anal/Prog		COBOL
DOS	Prog		COBOL
MVS	Prog	IDMS	PLI
MVS	Prog	TSO/SPF	Fortran
DOS CMS	Prog	CICS/ADABAS	COBOL
MVS DOS/VSE	Prog	Datadictionary/Talisman	COBOL
MVS	Analyst (Operational)	VSAM, CICS DLI, RAC-F	Assembler
	Database Analyst	IMS	—
OS/MVS/CMS	San Anal, Anal Prog	RAMIS, CMS, FCS, EPS	PLI
DOS/VSE, VM/CMS	Prog	CICS	COBOL
MVS	Prog	CICS	COBOL
DOS/VSE	Anal/Prog	CICS/DLI	PLI
DPPX	Prog	DTMS	COBOL
MVS	Anal/Prog	IMS/DB ± CICS	PLI
MVS	Anal/Prog	—	Mk IV
VM/CMS	Analyst	—	Mk IV
EDX	Anal Prog	—	Assembler
Syst 34, 36, 38	Progs (any number)	—	RPG III or COBOL
Syst 36	Systems Designer	—	RPG III
IBM PC/Apple/Micro	Anal/Prog	D Base II	Basic
IBM	Anal/Prog	Focus	—

Contract (Various London)

ICL VME	Progs	IDMS, TPMS ± LAFIS	COBOL
ICL VME	Anal/Progs	IDMS, TPMS ± LAFIS	COBOL
Datapoint	Anal/Progs, Progs		Databus
NCR 90/20/30 - IMOS 5	Anal/Progs, Progs		COBOL
Wang VS	Prog		COBOL
Honeywell 66	Prog	IDS, TDS	COBOL
UNIVAC OS 1100	Prog	DMS 1100	COBOL

Contracts U.S.A.

Op System	*Position*	*Package*	*Language*	*Location*
IBM DOS	Anals or Progs	CICS/DLI	COBOL	San Francisco
IBM OS or MVS	Progs and Anals	CICS/DLI	PLI	San Francisco
IBM VM/CMS	Systems Progs	—	—	San Francisco
IBM VM/CMS	Progs and Anals	IDMS	COBOL	San Francisco
IBM DOS	Progs and Anals	IMS DB ± DC	COBOL or PLI	San Francisco
IBM OS	Progs, Anals	IMS DB ± DC	COBOL or PLI	San Francisco
SEL	All levels		Any high level Real-Time	U.S.A. three locations

Contracts S.E. England

IBM DOS/VSE	Anal/Prog	COPICS	COBOL
IBM DOS or OS	Anal/Progs	CICS ± DIL	COBOL
IBM DOS or OS	Analysts	—	—
IBM DOS	Anal/Prog	MANTIS	—
IBM OS/MVS	Test Engrs	IMS DB/DC	COBOL
M6809 UNIX	Prog		Pascal
ICL ME 29 (TME/TP)	Anal/Prog	IDMS	COBOL
Burroughs 1900	Anal/Prog	—	COBOL

Contracts S.W. England

IBM MVS	Progs	TSO/SPF	PLI
IBM MVS	Progs	IMS DB/DC	PLI
IBM MVS	Progs	IMS	PLI
ICL GII DME	Progs	MAXIMOP, UNIPAY	COBOL
Data Point DOS/RMS	Progs		Databus
UNIVAC 1100 EXEC	Anal Progs	—	JSP COBOL

Contracts N.W. England

IBM MVS	Syst/Analyst	CICS	—	
IBM MVS	Systems Anal's	—	—	
IBM MVS	Analysts	—	—	

Contract Software Engineers and Scientific

Op System	*Position*	*Package*	*Language*	*Location*
DEC PDP 11/70	Progs	—	Macro II	SE England
DEC VAX 11/750	Anal Progs	Real-Time simulation	RTL2	SE England
INTEL 8086	—	Real-Time	Assembler	SE England
ICL 2906 (DME/G III)	System Progs	Real-Time	Assembler	Liverpool
DEC VAX 11/750	Software Engineers	Real-Time	Any high level language	SE England
DEC RSX 11M	Progs	—	Coral 66	Kent
DEC RSX 11M	Software Engineer	—	Coral 66/ RTL2/Macro II	Surrey
DEC RSX 11M	Systems Prog	—	Fortran	Hants.
DEC VAX	Software Engineer	Mascot	Coral 66	5 locations U.K.
Motorola 6800	Software Engineer	—	—	Herts.
Motorola 6800	Software Engineer	Communications	Assembler	Herts.
INTEL 8086	Hardware Engineer	—	Assembler, PLM, Coral	Herts.
—	Mathematical Modeller		Fortran	Berks.
Z80 CPM	Software Engineer	Communications	Assembler	Herts.
INTEL 8086	Software Engineer		Assembler	Northants.
Micro (any)	Hardware Engineer	TTL Logic Design	—	Northants.
VAX	Progs	—	Fortran	Surrey
—	—	—	Fortran 77	Surrey
—	Technical Author	Hardware	Software	Surrey

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VAX MACRO Progs Surrey Urgent

Permanent Client Opportunities — Call Peter or Paula

Position	*Experience/ Education*	*Hardware*	*O Syst*	*Packages*	*Languages*	*Location*	*Salary*
Lead Development Analyst	Degree — Structural or Civil Engineering	IBM Prime	MVS Primos	— PDMS		Middlesex	18K
Analyst/Prog	Extensive knowledge MSA	IBM	DOS/VSE	VSAM	COBOL	SW London	12.5K
System Analyst	Database + Insurance Experience	IBM	DOS/VSE			Surrey	10.5K
Team Leader	Good insurance experience	IBM	DOS/VSE/VM with AF1			Surrey	13K
Operations Supervisor	Syst prog, operations, supervisory, management experience — all essential	IBM	MVS			Middlesex	17.5K
Network Supervisor Min. 5 years experience	Degree — Technical Involves extensive world-wide travel	IBM 4341				London	15K
Analyst/Prog for new installation	Mathematical/ Numerical applications	Syst 38	OS		COBOL RPG III	City	13K
Analyst/Prog	Min. 2 years experience	Syst 38			RPG III	Middlesex	12K
Software Engineer	BSc — Extensive Real-Time experience	INTEL			ASSEM PLM	Berkshire	16.5K

Permanent Client Opportunities continued

Analyst/Prog	Insurance experience	ICL	VME	QPAC	COBOL	Surrey	9.5K
Sen Analyst/ Prog	Degree in numerate subject good telemetry experience essential	DEC LSI 11/23			Macro II Fortran	Sussex	14.5K
Software Engineers	Real-Time defence experience essential	DEC/VAX PDP	VMS RT 11 RSX 11 M	Mascot	Pascal Micropower	Cleveland Gloucestershire	15K
COBOL Prog	Demanding new development environment — provides a challenge	HP 3000		Image + View	COBOL	Brighton	10K

Permanent Client Opportunities — Midlands — Call Keavan

Position	*Op System*	*Package*	*Hardware*	*Language*	*Location*	*Salary*
Senior Programmers	IBM MVS/IMS	Any	IBM 3033 IBM 8081	COBOL	Manchester	14K+
Analyst/Programmers		MAAPICS	IBM Syst 34 RPG II IBM Syst 36 RPG II IBM Syst 38 RPG III		Birmingham	13K
Senior Analyst/ Programmers	IBM DOS/VSE	COPICS CICS	IBM 4341	COBOL PL/1	Coventry	12K
Project Leader	IBM VMS		DEC VAX	Basic Macro	Birmingham	14K
Operations Supervisor	IBM VMS	*MUST* have Telecoms experience	DEC VAX	Basic	Birmingham	14K

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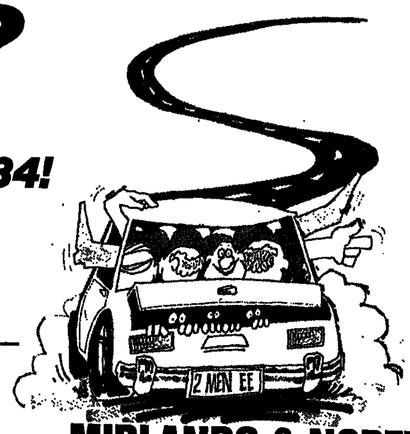

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ANALYSTS (Senior level) with Military systems expertise	**KP143**
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CORAL 66, all levels	SC104
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DG AOS Assembler Progs	CW153
HARDWARE/SOFTWARE ENGINEERS	SC107
HONEYWELL L6 GCOS SCREENWRITE or COBOL Progs	DB108
HP3000 COBOL RAPID IMAGE Progs	PH109
HP3000 QUICK QUIZ COBOL Progs	PH110
IBM Mark IV Progs	PH144
IBM Series 1 RPS Assembler Progs	PH136
IBM 8100 DPCX or DPPX Progs	**KP/PH111**
IBM PL1 some with JSP	DL/DB112
IBM COBOL IMS DB/DC Progs	**DB/DL113**
IBM OS MVS COBOL TSO/SPF Analyst/Progs	SC114
IBM COBOL with Adabas Progs	**SC137**
IBM COBOL with any Database Progs	SC145
IBM OS MVS JES 3 System Prog	**DB115**
IBM OS MVS Systems Prog	PH146
IBM COBOL IMS ADF	DB116
IBM COBOL with Michael Jackson Techniques	DB138
IBM COBOL CICS/DL1	**DL/CW/PH118**
IBM OS MVS Tech Support Prog	DB139
IBM System 38 RPG III or COBOL	KC/DB/SC119
IBM MANTIS Progs	**KP120**
ICL COBOL Progs (to be trained in IDMS/TPMS)	CW154
ICL IDMS Analyst Designers	CW155
ICL 2900 VME Systems Prog	SC147
ICL 2900 VME COBOL, some with TPS	KC121
ICL 2900 VME COBOL with Querymaster Prog/Analyst	KP156
ICL COBOL with TOTAL Progs	DL122
ICL DDS Consultant	SC148
ICL VMEB IDMS COBOL all levels some with TPMS	DB/SC/PH/CW124
ICL VMEB IDMS Tech Support Prog	KC140
ICL VMEB COBOL with SCL	PH125
ICL DRS BASIC Prog	PH126
INTEL 8086 PLM Software Engineers and Progs	DL157
PDP11 RSX Macro 11 Prog (Banking)	DL149
SYFA SYBOL Analyst Prog	SC158
TANDEM Analyst/Progs	SC/PH128
TECHNICAL AUTHORS	**PH/SC130**
UNIVAC 1100 COBOL Progs	SC131
VAX SYSTEL COBOL Progs	PH/DB132
VAX VMS COBOL Progs	DB133
WANG COBOL Progs	KC161

Contact: STEVE CASEY, PETER HOLLIDAY, CHRIS WHETHERLY, DAVE LONKHURST, KEITH POOLE, DAVID BROWN, KEN COTTOM, SANDRA CAREY, EILEEN CARMICHAEL or HELEN HEARNE

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Contact: ALAN PAINE or LYN ADAMS

OVERSEAS 0252 516141

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Start April '84, 6 months
Contact: Chris Whetherly

HOLLAND Contact: BILL TORBITT

	REF:
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ELECTRONIC TELEPHONE EXCHANGE Software Engineers	BT 136
M 68000 'C' Assembler Programmers	BT 137
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DATA GENERAL MV COBOL Programmers	BT 140
PRODUCT-TESTERS Communications Interfaces	BT 141

MIDDLE EAST Contact: BILL TORBITT

TECHNICAL WRITERS (SCRIPT/TSO or VM/DCF)	BT 142
VM Systems Programmer	BT 143
Office Systems Analysts (IBM, WANG, DEC Equipment)	BT 144
Data Security Specialists	BT 145
Risk/Benefit Analysts	BT 146
Strategic Applications Planners	BT 147
IBM PC Applications & Programming Specialists	BT 148

SOUTH AFRICA Contact: BILL TORBITT

Data General MV 4000 OS/VS COBOL Programmers – Family Status	BT 149

USA Contact: STEVE WHITING, SANDRA CAREY or BILL TORBITT

IBM Mark IV Progs	SW1
IBM COBOL IMS DB/DC Progs	SW2
IBM PL1 with IMS DB/DC Progs	SW3
IBM COBOL IMS & ADF Progs	SW4
HONEYWELL DMIV GCOS COBOL Progs	SW5
UNIX and C Progs	SW/BT 6
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IBM 4300 COBOL – SENIOR ANALYST PROGRAMMER – CICS and DL1, SUSSEX
IBM SYSTEM 34/36 PROJECT LEADER RPGII Maspics, SURREY
IBM DOS VSE PROGS COBOL Assembler Basic CICS DL1, SURREY and HANTS
IBM SYSTEM 32/34/36/38 RPGII and III PROGRAMMERS – Various locations
ICL/IBM Database Designers, Analysts, Consultants – Various locations
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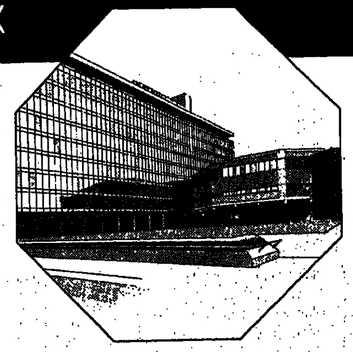

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- Conversant with Block-structured high level languages (eg. PASCAL, CORAL) and operating systems such as CONTEXT or RSX11

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Ref MS1

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2 Component/Reliability Engineers to work on all aspects of component specification and procurement including MIL-HDBK-217 reliability predictions and vendor liaison and assessment, in conjunction with QA and Purchasing Departments.
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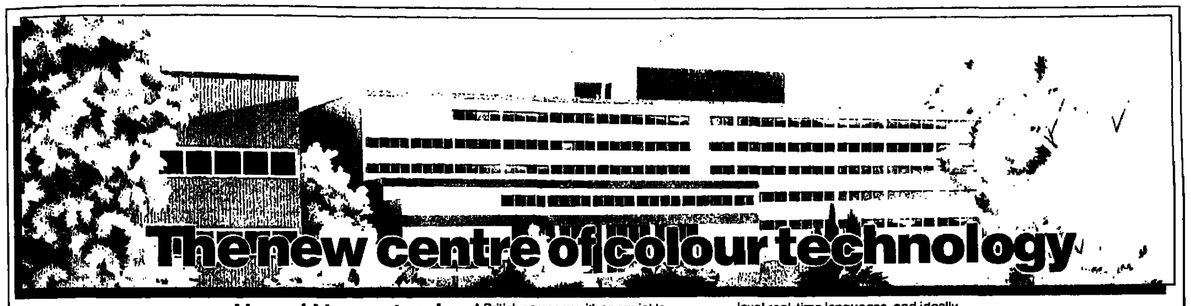

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(8341)

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Experience of PL/1 and/or Assembler would be ideal. However candidates with good logical and creative skills will also be considered.

In addition, we have an opportunity for a candidate with strong DL/1 experience.

Our client is happy to accept people on a contract or permanent basis.

Initial interviews will take place in the UK during the next two weeks. If you would like to be considered for these opportunities please send a comprehensive CV to Joan Lovejoy, Computer Search & Selection Limited, Hamilton House, Marlowes, Hemel Hempstead, Herts HP1 1BB, or for further information telehone 0442 40761.

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The person we seek will have the ability to combine technical excellence, with an instinctive feel for systems work and an ability to communicate effectively with customers.

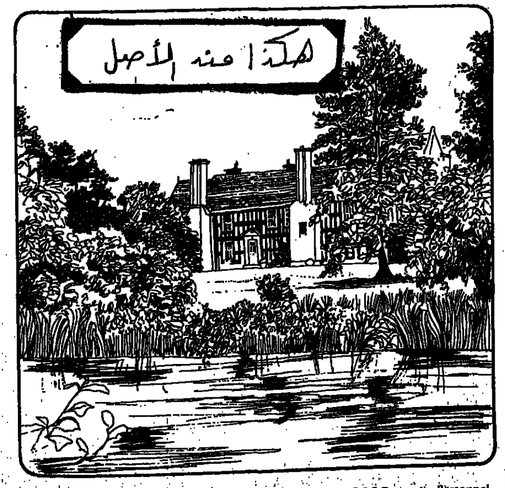
Considerable travel is involved.

Initial interviews will take place in the UK within the next two weeks. If you would like to be considered for this vacancy, please send a comprehensive CV to Joan Lovejoy at Computer Search & Selection Ltd, Hamilton House, Marlowes, Hemel Hempstead, Herts HP1 1BB, or for further information telephone 0442 40761.

CS+S Computer Search & Selection

ICI **Pharmaceuticals Division**

Systems Specialists
DEC and HEWLETT PACKARD



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THE INSTALLATION
The Division operates a number of mainframes and minis with about 450 terminals and all the systems software and hardware associated with one of the UK's largest Pharmaceutical research and production operations.

Major new systems are currently being developed on Hewlett Packard (HP 3000 & HP 1000) and DEC (VAX 780, VAX 750, PDP11) machines.

THE POSITIONS
Two technical support vacancies exist within a team looking after software developments in a rapidly expanding mini-computer environment. One position will initially be associated with VAX systems software and applications development, and the other with a similar range of work on HP equipment. Applications to be supported require database and on-line systems experience.

EXPERIENCE
Ideally candidates will be graduates in a scientific or numerical discipline with five years computer experience gained both in programming (including Cobol and/or Fortran) and technical support. Experience gained across more than one computer manufacturer preferably including VAX or HP would be particularly relevant, although specific training will be provided where required.

BENEFITS
In addition to the salary other benefits include up to five weeks holidays, profit sharing and bonus payments, an attractive relocation package and good career prospects.

(6378)

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Computer Skills International Inc, 1 Buckminster Place, Framingham, Massachusetts 01701, USA. Telephone: 0101 617 872 1225.

IBM

IBM MVS CICS DL/1 COBOL (APRIL START) PROGRAMMERS
IBM S/38 RPG3 MAAPICS ANALYST/PROGRAMMER
IBM BANKING (3 MONTHS + URGENT) SYSTEMS ANALYST
IBM IMS (DB AND/OR DC USEFUL – NOT ESSENTIAL) COBOL PROGRAMMER/ANALYST
IBM ASSEMBLER CICS (MACRO LEVEL), OS OR MVS PROGRAMMERS
IBM DOS/VSE COBOL ASSEMBLER CICS ANALYST/PROGRAMMERS AND PROGRAMMERS
IBM S/38 RPG3 ANALYST/PROGRAMMER
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In addition to the current requirements below, our increasing attention in the North of England means that we need contractors with a diversity of skills to join us for work in the area. REGISTER WITH US NOW IF YOU WANT A NORTHERN CONTRACT. ASK FOR EDDIE LESTRADE OR DAVE COLLIER ON: 0442 40761.

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IBM DOS/VSE CICS DL/1 DPD PROGRAMMERS
IBM MVS/DOS PL/1 PROGRAMMERS
IBM DOS/VS COBOL CICS/DL/1 PROGRAMMERS
IBM S/38 RPG3 ANALYST/PROGRAMMERS
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ICL VME IDMX TPMS COBOL PROGRAMMERS
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GEC 4084/86 CORAL SOFTWARE ENGINEERS
HONEYWELL L64 IDS/TDS PROGRAMMERS AND ANALYST/PROGRAMMERS
VAX UNIX C PROGRAMMERS
ANY MINI MICRO C/PASCAL PROGRAMMERS
REALTIME DEFENCE APPLICATIONS EXPERIENCE ANALYST/SOFTWARE ENGINEER
PDP 11 RSX11/M CORAL/PASCAL SOFTWARE ENGINEERS
Z80/8086 CORAL PROGRAMMERS
HONEYWELL COBOL DMA PROGRAMMERS
GMC PICK RPL 6801 PROGRAMMERS
HP3000 COBOL STRUCTURED PROGRAMMING EXPERIENCE PROGRAMMERS
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IBM OPERATIONS MANAGER

SCOTLAND
IBM DOS COBOL CICS PROGRAMMERS
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IBM MVS IDMS FOCUS ANALYST PROGRAMMERS

OTHERS

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VAX 11/780 SYSTEL COBOL PROGRAMMERS
VAX 11/780 DMS2 COBOL ANALYST/PROGRAMMERS
VAX 11/780 COBOL ANALYST/PROGRAMMERS
VAX 11/780 MASCOT CORAL 66/FORTRAN SOFTWARE ENGINEER
VAX COBOL ANALYST/PROGRAMMER
VAX VMS FORTRAN PROGRAMMERS AND ANALYST PROGRAMMERS

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CS+S Computer Search & Selection

(6405)

SUPPORT PROGRAMMER/ANALYST

Salary Range £8,500 – £11,550 p.a. + Benefits **Beds**

Our Group, with an unrivalled reputation for excellence across a diverse range of high-tech products has successfully established its Central Support Group for the European Sales operation.

Now, due to promotion, we are able to offer a position of PROGRAMMER/ANALYST to provide a full range of services to our plants throughout Western Europe. Based in our prestigious complex in Bedfordshire, you will travel when required, to assist both users and sales staff on the effective use and development of systems.

The person we seek should have experience of COBOL in a mainframe environment, but also have had exposure to the personal computing sector, as this is a growing facility within the Group.

Your brief will be to provide effective programming and analytical support in identifying opportunities to improve sales effectiveness through computerised aids, training on current systems, improved sales systems, training of sales staff on software available within personal computing. The ability to produce systems and programming specifications, together with the task of ensuring that these will enhance the effectiveness of sales staff, will be the main objective.

Personal attributes required are a business orientated personality with the self-discipline to plan your own activity and the ability to interface at all levels, both in a user and training situation.

This is a career opportunity coupled with an attractive range of benefits, including profit sharing, private health plan and full relocation where necessary.

Candidates wishing to seize this opportunity should contact our Advising Consultant, **Brian Harris on 021 236 3781** (24 hour answering service) or send a Résumé to the **Birmingham** address shown below at the earliest opportunity.

- ★ ***International Projects***
- ★ ***Career Position***
- ★ ***PC Involvement***
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(6397)

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We realise that we ask for many qualities in our search for new talent. This will come as no surprise to people who are familiar with our methods. A sound computing background is necessary to talk sensibly to the range of people in the industry with whom we deal and an interest in helping those people is vital in providing objective assistance. For those of you who are trapped on a fixed income and who would be attracted by a reward system related to effort, this could be your ideal move. You will be given on the job training to help you achieve performance goals and every encouragement to develop your own style of working. First year earnings should not be less than £14K and can be significantly higher. A company car is provided after a qualifying period with no upper limit to eventual earnings.
Some jobs offer high rewards, some offer significant job satisfaction. If you are successful as a recruitment consultant you can have both.

Contact Terry Harvey

- * Age 25/30
- * Ambitious
- * Self Starter
- * Financially Motivated
- * High Energy level
- * Competitive
- * Degree level

Systems Programmers
Oxon. **to £13,000**
We are seeking degree level programmers who have experience working at assembler level and with high level languages preferably gained on implementing systems software. Ideally you will also have a reasonable understanding of microcomputer hardware. Our client has opportunities for you using 16-bit processors and gate array technology in the development of new, advanced products. Relocation assistance where appropriate.

Micro Sales Support
Bucks/Berks. **c£11K + car**
You will probably have had a programming background in business and commercial applications from which you will have gained in-depth knowledge of CP/M based micro systems. We will expect to see a well presented person with a confident, pleasant manner who can think on his/her feet. Our client's name and products are already an established part of the micro business world.

Technical Applications
Herts. **£8.5K-£12.5K**
The systems division of a major computer manufacturer requires several experienced analyst/programmers for positions caused by expansion. Ideally 2 years in a well structured environment with 4 or more for team leader level positions. The company expects to host candidates for most of a day to cover technical and personnel interviews and a tour of the facilities. Excellent long term career prospects.

Fortran Prog/Analyst
S. Middx. **to £14,000**
You will be a member of a small team in the U.K. which is part of the parent company's Advanced Technology Group. Responsibilities will cover the development and support of applications software in power systems engineering. The job will require some international travel and an element of training in the U.S.A. Career development prospects are excellent. D.G., DEC, Prime and H.P. equipment.

Software Engineers
Herts. **£9.5K-£12.5K**
Ideally your assembler experience should be MACRO-11 or IBM 370. You will join a team where you will be expected to participate in a range of activities which could include product validation, communication, i.e. technical input to support for PTT and other authorities, LAN interconnections, IBM specials or DEC PDP-11 software. Occasional U.S. and European travel. A golden opportunity to extend your career with a major company.

CAD/CAM Development
South-West **£8K-£15K**
This is an outstanding opportunity to join a respected company in the CAD/CAM field with an impressive range of systems. All development work is in 'C' or Pascal on DEC VAX's running UNIX; however, our client is interested in applicants at all levels with one year or more experience of high-level scientific languages such as ALGOL, FORTRAN, CORAL, etc.

Industrial Applications
Hants. **£10K-£14K**
A major international company has several vacancies created by expansion which require DEC software expertise. Systems are from PDP-11 to VAX with experience required in Macro-11, FORTRAN, BASIC, Pascal and Ada. Projects cover industrial control, instrumentation, real time simulators and in-house applications. If you have from two years experience upwards please get in touch.

Support Programmer
W. London **£10K-£12K**
Significant growth in international travel business and demand for our client's services and products has created the requirement for an additional member of the support team. Local VAX application links to a major international network used by hotels, airlines and tour operators world-wide. We require high-level programming experience such as PL/1 or Fortran 77 or large DB query languages.

DEC Programmers
Bucks. **£10K-£12K**
Our client is a long established firm of Consulting Engineers. They have prestigious offices on the outskirts of a large town with attractive employee amenities. Although currently running a PDP 11/34 under RSTS/E a VAX machine and DEC micros are planned for this year. We wish to hear from programmers with sound FORTRAN/BASIC experience to work with design engineers.

Development Engineers
Cotswolds **£9K-£11K**
A specialist subsidiary of a large and successful engineering company requires a number of additional electronics engineers to join existing teams. Ideally graduate level with 2-3 years work experience at component level. Project engineers with hardware and/or software experience in real-time applications are of particular interest. This is a highly interesting and topical application of today's technology.

UNIX "Experts"
London **to £14,000**
A small team of computer science engineers with extensive experience in UNIX systems and currently developing very exciting high-resolution graphics work station, is seeking additional like-minded people to join their team. The company has major financial backing and is prepared to pay whatever is necessary to obtain the right people. An all too rare type of opportunity.

Commercial Analyst/Prog.
W. Middx. **c£11,000**
This is a marvellous opportunity to join a major international company in a small, friendly in-house D.P. Function. Candidates will be expected to modify and develop existing Data General systems in Finance and Personnel applications leading to new, planned systems. We will be looking for previous mini computer experience using COBOL/and or FORTRAN. Long term career prospects.

Detective Programmer
Herts. **£10K-£13K + car**
Post-sales support provides absorbing work for programmers with an investigative nature. Our clients range of software and facilities for this detective work in finding and fixing bugs presents a variety of problems which will keep you stimulated and busy every day. Most work is at base, but client visits to be expected. Assembler level and BASIC experience are preferred.

Real-Time S/W and H/W
S.W. London **to £15,000**
Owing to healthy and continuous expansion, our client requires additional real-time systems programmers ('C', Pascal, Assembler) and hardware engineers with a background in the design of bit-slice computers and microcoding. Typical applications include device drivers, multi-tasking, process control, C & C, communication and graphics display systems. An outstanding opportunity to join a highly respected consultancy and systems designer.

Comms. Team Leader
Herts. **to £15,000**
Our client has gone from strength to strength in recent years with significant steps in product innovation. The expansion of the company has created openings in a number of development areas and in particular software communications. We would like to hear from candidates with networking experience who can lead a department of designers in advanced product development. Relocation where appropriate.

Open letter to experienced computing staff seeking new opportunities

Our free service to you is advice and assistance in identifying the most suitable new position for the development of your career. Our consultants have held a variety of responsible positions in the computer industry. With this experience and their knowledge of the job market they are available to help you. The advertised vacancies are only a representative sample of the many that are regularly registered with us by our clients. Write or call us anytime to discuss your ideas.

Write or telephone **(02403) 28383** *during office hours.*
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IBM SYSTEM 38 RPGIII PROGRAMMER/ANALYSTS
IBM 8100 DPPX PROGRAMMERS – VARIOUS
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IBM 8100 DPPX COBOL PROGRAMMERS – VARIOUS
IBM 38 RPGIII – VARIOUS
IBM 4341 DL1 PL1 PROGRAMMER
IBM 4331 IMS DB/DC – VARIOUS
IBM CICS DL1 COBOL PROGRAMMER/ANALYST – VARIOUS

OTHER

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UNIVAC 1100 COBOL PROGRAMMERS
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PRIME FORTRAN PROGRAMMER
SYSTEMS ANALYST – STOCK CONTROL – HERTS.
DEC DATATRIEVE DESIGN ENGINEERS -- URGENT
GEC 4000 BABBAGE RTL2
PRIME COBOL PROGRAMMER
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DEC VAX VMS 'C' PASCAL COMMS ANALYST/PROGRAMMER
INTEL 8086 RMX ASSEMBLER ANALYST/PROGRAMMER
HOGANS BANKING PACKAGE EXPERTISE – URGENT
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HP3000 IMAGE QUERY COBOL ANALYST/PROGRAMMER
BURROUGHS CONVERSION MCT 4800 TO 7800
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(8417)

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However we do not rule out the possibility of ... candidates from other backgrounds.

In addition to the competitive salary and company car we can offer an attractive benefits package which includes non-contributory pension, profit-sharing schemes, free life-cover, BUPA, plus full relocation to this attractive part of ... shire.

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Where there's growth, there's Hambro Life

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Operating today as part of the Allied Hambro group of companies, Hambro Life is growing on all fronts, and this growth in business is made possible by the integrated computer systems which support our Administration. Our use of technology has, therefore, grown as the Company has grown.

And you don't have to look for the evidence – the expansion of work in D.P. has meant that recently we've been advertising in the computing press for more first-class people to join our Systems and Programming departments.

We can also offer career growth based on pure technical merit, and the contribution made by our Operations & Network Support Specialists has always been recognised and generously rewarded.

In short, if you're not thoroughly appreciated where you are now, you will be at Hambro Life and specifically in the following positions:

NETWORK SUPPORT SPECIALIST
up to £13,000

Our Network Support area is looking for another specialist, with experience in Network installation, problem diagnosis and fault fixing. You should also have the ability to explain technical problems to non-technical users.

SENIOR PROJECT ANALYST
up to £13,000

This is a senior vacancy in our User Support Group and you should have a detailed knowledge of JCL and be able to demonstrate a proven track record in an IBM operational environment.

OPERATIONS PROJECT ANALYST
up to £10,000

This is an excellent opportunity for an experienced JCL writer who has some project work experience in an operational environment.

DEPUTY SHIFT CONTROLLER
up to £12,000
(inclusive of shift premium)

Ideally you will currently be a successful shift leader or senior operator within an IBM installation. We can give you the opportunity to use this experience in taking responsibility for a part of our four shift system.

Experience of MVS/JES and JCL is essential.

Our remuneration package is first class with a non-contributory pension, free Life Cover, BUPA, Profit Sharing and Share Option schemes, together with generous assistance with moving to Wiltshire.

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Please send me your recruitment booklet and application form.

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هكذا من الأصل

ALLIED HAMBRO FINANCIAL MANAGEMENT

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Data Administration Analyst

Uxbridge **c£11,000**

Our client, **Rank Xerox**, is the world leader in reprographics, a highly successful and profitable organisation with a massive investment in data processing worldwide.

This key appointment is within their International Systems Development organisation. Your role will be to support the development of a large scale integrated **IMS DB/DC** systems environment for implementation throughout their European subsidiaries.

You will work within a support team whose primary responsibilities include data analysis, data dictionary control, logical database design, and liaison with project groups and operating subsidiaries to establish control and standardisation of corporate data.

The operating environment is multiple **IBM 3083** with **MVS/SP, IMS DB/DC, Datamanager, Roscoe, Panvalet.**

You should have a background in system analysis or programming. Some knowledge of data analysis and the use of data dictionaries would also be advantageous.

Whilst your starting salary will be dictated by your level of experience, you can expect to progress rapidly within an organisation which places considerable emphasis on career development.

To apply please write or telephone quoting ref. ML7805.

Lloyd Chapman Associates

123, New Bond Street, London W1Y 0HR 01-499 7761

Young Business Champions

Up to £25,000

Our client's business stands at the threshold of a new era. It is already a force in an area of business which has grown at an astonishing rate. This pace will accelerate through the introduction of a new range of state-of-the-art microcomputer products which will take the market forward dramatically.

Our task is to find the core sales team for this new development. We are inviting applications from extremely bright high fliers who want an opportunity to drive the business forward. The jobs to be filled are not for traditional sales people.

We need for this team, people of considerable intellectual ability, high energy and self-awareness. They will work in an extremely stimulating environment as the Company already employs a highly talented and committed team.

For these crucial roles, we expect to meet people who have achieved a great deal and now wish to work in a creative and fast growing environment, and this is of greater importance than the area in which you have acquired your track record to date. If you feel what we have said strikes a chord, we are anxious to know about you and to discuss your role in our client's future. Age indicator 25-35 years.

To apply either send a curriculum vitae or telephone for an application form quoting reference YBC/GK. Please address your replies to Geoffrey King, Managing Director of Cambridge Recruitment Consultants. *These positions are open to both men and women.*

Cambridge Recruitment Consultants

1a Rose Crescent, Cambridge CB2 3LL. Telephone: 0223 311316.

T.I. 990

PROGRAMMER/ANALYST

Salary range £8,500 – £11,500 plus benefits **Beds**

"A unique opportunity for your career to take off with one of the world's major blue chip Organisations"

We are a multi-national Corporation and wish to enlarge our Central Support Group which is currently involved in developing, implementing and supporting a range of systems for our European sales operation.

An opportunity has now been created within the Support Group, due to internal promotion, for an experienced Programmer/Analyst with TI 990/COBOL. Having seen the implementation of major new systems in a number of European sites, we require your skills to maintain the momentum of development, later moving into on-site implementation of these systems, travelling to such locations as Helsinki or Madrid.

Our ideal person will have sound experience of **TI 990 COBOL** and will be able and willing to travel, sometimes at short notice, to various locations throughout Europe for perhaps one or two weeks at a time.

Our network of TI 990's interfaces with a large IBM mainframe resource and, you will also become involved in this and other levels of computing. You will also have the opportunity of becoming involved in up-to-date technology including such interesting aspects as electronic mail. The Central Support Group forms part of a large Management Services Organisation which provides a comprehensive range of d.p. services to internal departments throughout Europe.

We see this as a superb opportunity for an energetic and ambitious Programmer/Analyst who wishes to build a career with one of the world's major blue chip Organisations. We have the opportunities available – if you have the talents to match. We are quick to identify potential and promote on merit – not on length of service.

We also offer an attractive range of benefits which include profit sharing, private health plan and full relocation expenses. We have attractive modern premises situated close to the centre of an historic market town which is surrounded by pleasant Bedfordshire countryside, yet only 45 minutes from the heart of London.

Give your career a chance to really take off – contact our Advising Consultant **Brian Harris** on **021 236 3781** (24 hour answering service) or send him your current Résumé to the **Birmingham** address shown below, at the earliest possible opportunity.

(8364)

Technical, Sales & Management Appointments

ESDR

Specialist Computer Recruitment Ltd

SOUTH
James House, 46 James Street, London W1M 5HS
01-935 0671/486 0481

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35-37 Great Charles Street, Queensway, Birmingham B3 3JY
021-236 3781

NORTH
International House, 84 Deansgate, Manchester M3 3EE
061-833 0427

BELGIUM
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010 3120-750947

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TPMS & IDMS – Designers

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RATES FROM £350-£750 PER WEEK

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For further details of these contracts please contact John Read on 0734-788213 or send full CV to:

RTL

RTL Software Services Limited

Wingmore Lodge, 2 Rose Street, Wokingham, Berkshire RG11 1XU. 0734 788213.

RSX DEVICE DRIVERS

In SWITZERLAND/FRANCE

S-COM Computer Systems Engineers Ltd. is a highly successful system house with an impressive growth rate over the last three years. Our client base consists of major international companies and government establishments involved in leading edge Realtime developments in both the UK and Europe.

S-COM currently has a vacancy for a Senior Software Engineer with at least four years' industrial experience in a true realtime environment. An excellent knowledge of DEC equipment plus design and implementation experience of device drivers on RSX11 is essential.

Upon joining **S-COM** the selected candidate would be expected to undertake an assignment of approximately six months' duration in one of the most picturesque parts of Europe, on the Swiss/French border. The assignment carries a salary of between £11 and £17k, depending on experience and ability, the usual company benefits and an extremely generous overseas allowance.

This appointment also represents the opportunity to develop an excellent career with a fast-moving, forward-looking company.

For further details of this post – or any other career opportunities with **S-COM** – call Lawrence Mills or write enclosing a full c.v.

(8442)

S-Com Computer Systems Engineers Ltd.
Tower House, High Street,
Aylesbury, Bucks HP20 1SQ
Telephone: Aylesbury (0296) 32023
Telex: 837520 ADTRAV G

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Our client, pioneers of software design for word processing, has rapidly achieved a prominent position in the U.K. in the field of high technology. In keeping with their pioneering spirit, they are at present heavily involved in the field of distributed processing. With specialist expertise in design, manufacturing and marketing, their turnover exceeds 50 million pounds, with demands for their products still growing.

Right now to keep abreast of their impressive planned expansion for the 80s, they are looking for a large number of Junior, Senior and Specialist R & D software engineers to come and be part of what are considered Europe's leading software development teams in Word Processing, Personal Computing and Communications technology.

Based in London and the South West of England, the successful candidates will have a minimum of 2 years' experience in Communications/Office Automation or related areas and high level language programming (PLM86 or C). Further experience of Unix, Pascal, Cobol, Coral, CP/M or PC/DOS will also be an advantage. Candidates should also have some knowledge of the design of operating systems and Database techniques.

In return we are offering extremely competitive salaries ranging from £8,000 to £18,000 and company cars, depending on age, experience and potential. This is in addition to a very valuable benefits package.

So if you have the experience we require, combined with ambition and the determination to succeed in a young, dynamic organisation at the forefront of technology, then we would like to hear from you.

For further details, please ring Steven Knowles-Baker on 01-370 2012/3, or alternatively, send a brief C.V. to him at N.K.B. Associates Ltd, 159 Gloucester Road, South Kensington, London SW7 4TH.

All enquiries will be treated in the strictest confidence.

nkb

THE COMPUTER SPECIALISTS . . .
PLACING COMPUTER SPECIALISTS

(8321)

Analyst/Programmers

FORTRAN? — A rare opportunity.

Manchester **to £10K + Car**

As the computing industry continues to change rapidly, only those who can adapt to change and gain relevant experience quickly will ultimately be successful. To do this, you need the opportunity to work in an environment which offers exposure to the latest technology both hardware and software.

Our client is the European Headquarters of one of the largest computer service organisations in the world. The company deliver business solutions into specific industry sectors via bespoke software development, facilities management, and turnkey systems based on mainframe to micro computers. Extensive use is made of a wide range of DEC hardware and software.

Due to the company's outstanding success, they seek to recruit a number of people with sound FORTRAN experience to play significant roles in major projects.

Applicants should be able to participate in the design of systems and have the necessary personal skills to be able to work closely with clients and supervise other project staff.

These positions offer you the opportunity to:

- **Stay at the forefront of technology (including the use of UNIX, Relational databases, 16 bit micros etc.)**
- **Broaden your analytical, programming and project management skills on a wide variety of applications.**
- **Progress rapidly within a diverse and stimulating computer services environment.**

The excellent remuneration package includes an initial salary of up to £10,000, company car, and flexible hours.

Please telephone Andrew Cousins on (0734) 595346 for further information or write enclosing full c.v. to the Reading Office. Interviews will be held in Manchester or Central London.

McCOURT COUSINS LTD.
Computer Recruitment Consultancy (8327)

27-29 Greyfriars Road, Reading, Berkshire
Telephone (0734) 595346 (24 hours)

Chesham House, 150 Regent Street, London W1R 6FA
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SALES EXECUTIVES

BYTE SHOP BUSINESS CENTRES

c.£15K PLUS CAR & BENEFITS PACKAGE

LOCATIONS: CENTRAL LONDON, MANCHESTER, BIRMINGHAM, SOUTHAMPTON, NOTTINGHAM, GLASGOW.

Due to rapid and continuous expansion, The Byteshops, the U.K.'s leading chain of specialist micro-computer stores, are seeking high calibre Sales Executives at each of their regional business centres. Applicants must have a minimum of two years' sales experience in the computer industry and will already be selling micros in a retail, dealer, manufacturing or distribution company or alternatively have worked with minis or mainframes. As The Byteshops are one of the U.K.'s largest IBM PC and ACT Apricot dealers, familiarity with these models would be an advantage. Greater importance, however, will be attached to a knowledge of routine business and/or specialist application software. These are genuine career opportunities for ambitious Sales Executives who can work on their own initiative.

A generous salary package is offered with up to £10K p.a. basic plus a realistic commission scheme enabling earnings of £15K p.a. to be fully achievable (most of our Sales Executives are already earning considerably more than this). As part of the Comart Group, you are assured of big company benefits, which include a company Ford Sierra 1.6L and both profit sharing and pension schemes.

Interviews will be held locally, but in the first instance telephone June Hamilton or Helen Wilson on 0480 215005 (24-hr. answering) for an 'information pack' and further details, or if you prefer, write and tell us about yourself, enclosing a short CV, addressing your letter to: June Hamilton, The Byte Shop Head Office, Little End Road, Eaton Socon, St. Neots, Huntingdon, Cambridgeshire PE19 3JG.

THE BYTE SHOP
Your Specialist Computer Centre

Trading Places

Analysts and Analyst/Programmers c.£14K.

West London

Rather than just sitting and watching others doing it, step up there and join the action.

The MIS team at UIP is an integral part of the whole worldwide business of motion picture marketing and distribution. That's why its dynamic growth is just a reflection of the company's success story.

And now there's the emerging new industry of Cable TV too, with all its obvious potential. Their confidence in the future is mirrored in a working environment that's professional, informal and designed to reward initiative and achievement.

Are you ready to trade places and join some top performers?

Analysts c.£14,000

To take the stage you'll need a background in applications programming with at least two years good experience of analysis on commercial/financial systems development, ideally on IBM mainframe. Plus strong user contact skills and the ability to see difficult projects through to a successful conclusion - on time.

Analyst/Programmers c.£13,000

To get into this picture you'll have to demonstrate a minimum of 2 years experience of IBM Cobol development programming under DOS/VSE with some online experience, ideally CICS. Plus some real ability in analysis and the potential to grow with the company. That's the ticket!

To join the cast call our adviser Richard Goldie on (0992) 552552 or send him a brief C.V. at Macmillan Davies Personnel Consultants, The Old Vaults, Parliament Square, Hertford SG14 1PU.

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Location will be primarily in Belgium with possibility of limited period assignments internationally. Salary will be commensurate with ability and experience.

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3030 Leuven
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Saudi Arabia

HP3000/64 Programmer

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An experienced programmer to support the DBA function: an understanding of IMAGE utilities is required which must include transaction logging and recovery. SPL (in addition to COBOL) and ADAGER experience would be ideal.

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Base salary c.£20,000 + annual bonus of 37.5% TAX FREE

[illegible] years' experience gained in a commercial environment. [illegible] similar preferred. Experience of [illegible] maintenance, scheduling or stock and inventory control would be ideal.

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SYSTEMS & PROGRAMMING

IBM PROGRAMMERS, ANALYST/PROGS and SYSTEMS PROGRAMMERS

SAUDI ARABIA & GERMANY £HIGH + Benefits

Excellent opportunities for IBM professionals to earn high salaries and enjoy a full range of benefits including a substantial MONTHLY BONUS. Applicants for Saudi Arabia should have a minimum of two years' DOS experience preferably gained in a CICS and DL/1 environment. Applicants for Germany should have two years' MVS experience preferably gained in an online database environment. Ref: T2487

MVS SYSTEMS PROGRAMMER

LONDON & H. CTS. to £17,000 + 2-litre CAR

Leading independent systems support consultancy seeks to recruit several MVS Systems Programmers to meet the ever-increasing demand for their services. Applicants should have a minimum of two years' experience. Excellent rewards and career prospects. Ref: T2486

SENIOR SYSTEMS ANALYST

MIDDX to £16,000 + CAR + Bonus

Major UK company wishes to recruit a highly experienced Senior Analyst to lead a team embarking on a large financial and accounting project. Top design skills are required together with the ability to communicate at all levels. Phone now for further details of this excellent opportunity. Ref: T2651

DATABASE ANALYST

CITY £12,000-£15,000 + MORTGAGE

Ideal opportunity for a Database Analyst to take full responsibility for this international bank's IMS database and DATA DICTIONARY. Candidates should possess two years+ experience as a Database Analyst and be conversant with COBOL. Good career prospects. Complete range of benefits including MORTGAGE subs. Ref: M2628

PROGRAMMERS ANALYST/PROGRAMMERS

LONDON & G. LONDON £9,000-£13,000 + CAR

Successful software house seeks to recruit several COBOL professionals to work on a variety of projects at their prestigious client sites. Applicants should possess a minimum of 18 months' experience. Phone now for further details. Ref: T2487

ICL OPPORTUNITIES

LONDON & HOME COUNTIES to £13,000

We have a number of clients, ranging from insurance companies, banks and bureaux to engineering concerns and retail outlets, who are seeking to recruit ICL professionals. Skills particularly in demand include ME29/TPS, ME29/MTS and 2900/VME. Many of these positions offer a technically challenging workload, career advancement opportunities and full company benefits packages. Ref: D/Gen

IBM ANALYST PROGRAMMERS

SURREY c. £12,000 + MORTGAGE

Following major plans for the expansion of their data processing department, this financial concern wishes to recruit high-calibre IBM COBOL Analyst/Programmers with online expertise. Excellent career prospects together with a substantial benefits package including MORTGAGE subs., annual BONUS, n/o pension and BUPA. Ref: M2559

PROGRAMMER — RPGII to RPGIII

CITY to £12,000 + MORTGAGE

International banking organisation is seeking two Programmers with a minimum of 12 months' RPGII experience to complement its expanding development team. One candidate should be able to offer good systems design skills. The bank offers full System 38 training and a comprehensive benefits package including MORTGAGE subs. Ref: D2406

IBM COBOL PROGRAMMER

CITY £11,500 + MORTGAGE

International bank retaining an IBM 3033 under MVS requires an IBM COBOL Programmer with two years+ experience. Working within a project team, the successful candidate will be involved in online applications development. Benefits include MORTGAGE subs., low-interest loans, n/o pension and BONUS. Ref: M2374

SYSTEM 36/RPGII PROGRAMMER

N. LONDON c. £11,000

New System 36 installation is seeking an experienced System 34/RPGII Programmer/Analyst or Programmer to become involved with their heavy development schedule. Working closely with the DPM, the successful candidate will be involved on a wide range of systems from design through to implementation. This position offers genuine scope for job interest and career progression Ref: D2549

SYSTEM 38/RPGIII PROGRAMMERS

SURREY c. £11,000

Excellent career opportunities exist within this new System 38 installation for RPGIII Programmers who wish to further their technical expertise and gain good systems design experience. You will be working as part of a small team responsible for developing a range of new commercial systems. The company offers genuine scope for career advancement and excellent fringe benefits. Ref: D2562

IBM COBOL PROGRAMMER

BERKS. £9,000-£11,000 + MORTGAGE

If you have two years' IBM COBOL experience and wish to acquire CICS and DL/1 skills, then this financial organisation have the opening you are seeking. You will be given every opportunity to further your career, programming for online development projects. A full benefits package is offered including MORTGAGE subs. Ref: M2434

IBM COBOL PROGRAMMER

N. LONDON c. £10,500

Due to further computerisation of their marketing system, this North London-based manufacturing concern has a requirement for an IBM COBOL Programmer. Applicants should possess 18 months+ COBOL programming expertise and preferably some online development skills, although the company are willing to train in CICS and DL/1. Ref: M2661

MICRO BASIC PROGRAMMER

ESSEX £6,000-£9,000

A minimum of six months' commercial programming experience will qualify you to join this friendly, busy team. Working for their well-established clients will enable you to gain broad commercial applications knowledge and to develop your technical expertise. This is an exciting career opportunity for those seeking involvement on a varied range of projects. Ref: D2405 (8430)

2000

Tel: 01-636 7584 (24-hrs)

Stockbroking City of London

Twice-yearly bonus

This progressive stockbroking firm has been operating since the turn of the century and was a pioneer in the use of economic analysis in investment decisions. They were also among the first stockbroking firms to deal extensively overseas and to advise clients to include overseas investments in their portfolios. As well as the usual broking services, they offer professional expertise in the following areas:

- Investment/Portfolio Management
- Investment Planning
- Economic Analysis
- Economic Research
- Gilted-Edged Market
- Overseas Investment
- Company Launch

The DP department is now well established, having developed its own standards and structured approach, yet has remained small—about a dozen—friendly and enthusiastic. They use DEC and HP equipment.

In addition to good salaries, a bonus is paid *twice-yearly* and staff are eligible immediately. These bonuses add significantly to individual's remuneration.

Please contact JOAN AINSWORTH on 01-681 8311 or write to her at: C.S.S., 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey CR0 9XF.

Analyst/Programmer

£10-12,000

Following its planned expansion path, the DP department is now looking for an analyst/programmer of good academic background, able to be responsible for their own part of a project from start to finish.

User contact plays a large part in the day-to-day activities of the department, placing requirements over and above those of technical skills on applicants. These interpersonal skills and an alert mind are more important than particular hardware and software experience, although obviously, any previous experience in the financial sector and knowledge of BASIC+2, would be very useful. If you have 1-3 years' experience and would like to contribute to the further success of DP within the partnership, we should like to hear from you.

Computer Search & Selection Ltd

COMMERCIAL OPPORTUNITIES

PL/1 Programmers Insurance, Surrey **To £11,000 p.a.**

As an essential element of this company's growth plans for 1984, a number of positions have been created for PL/1 programmers to support and develop a leading Financial organisation's current projects. An IBM/DOS/VSE background is essential and SHADOW experience would be desirable, however, in house training is provided.

In return the company offers a range of benefits which include flexible working hours, excellent pension scheme, subsidised staff restaurant, social and sports centres, 20 days annual holiday, and the opportunity to develop your career within a progressive company.

Systems Analyst (IBM 4343) Insurance, Surrey **To £13,000 p.a.**

A challenging opportunity exists for a Systems Analyst with a good knowledge of IBM online database systems to make a significant contribution to the development of a major project within this expanding DP department.

The ability to liaise effectively with users is essential and in return the company offers an excellent career and benefits package which includes: free life assurance, flexi-time, video training/courses and the chance to work with the latest technology.

Analyst/Programmer Major Oil Company, W1 **£8-£12,000 p.a.**

A major International Oil Company based in the West End currently has vacancies for Programmers and Analysts who wish to become involved in a wide range of Commercial projects. Experience of IBM 4341 DOS VSE CMS is an essential prerequisite alongside a knowledge of CICS and DLI.

Excellent company benefits include Group BUPA, £1,500 London allowance, LVs (£500 p.a.), 4 weeks holiday, 3% contributory pension etc.

For more information about these positions call Andrew Rutherford on 01-938 1804 or write to him enclosing a career resumé.

IP Information Processing People
Specialist Recruitment Consultants
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Telephone 01-938 1804 Telex 22861

FINANCIAL APPLICATIONS

ANALYST/PROGRAMMERS SUPPORT CONSULTANTS

Walton-on-Thames & Stonebridge Park

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We are looking for people who have experience in COBOL, on-line systems programming, Database or banking applications. This would be an ideal opportunity for those with approximately 5 years' commercial experience who now wish to further their career with a major manufacturer.

The Development Team is based at our offices in Walton-on-Thames, Surrey and the Support Group at our headquarters at Sperry Centre, London NW10.

Positions are available at a number of levels. We are offering starting salaries of between £9,000 and £13,000 in addition to the company benefits you would expect from a large organisation. Certain positions will include a company car as part of the package, and will necessitate international travel.

Please write enclosing your cv to Mrs. Valerie Solomon, Sperry, Sperry Centre, Stonebridge Park, London NW10 8LS.

SPERRY
We understand how important it is to listen.

(8352)

COBOL Programmers

Croydon to £10,000

Our client is an established Management Services department, in the process of developing new systems.

If you have at least one year's practical COBOL experience, preferably gained in a VME, DME or VMS environment, these positions offer you the opportunity of initial training in appropriate areas and other training as your career develops.

- Subsidised mortgage
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- Free BUPA
- Removal assistance
- Flexible hours
- LV's

ICL 2900 DEC/VAX Micros

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Computer Search & Selection

DEC Programmers

Surrey to £11,000

Our client, part of a major group of companies, is a young, dynamic software house looking to recruit experienced programmers, who will enjoy being part of a growing company and making their own effective contribution to its growth. Client contact is an important part of the job—which means that we are looking for able communicators who are articulate, presentable and in possession of a wide range of technical skills. These technical skills will include programming in COBOL and/or BASIC, (on commercial applications using DEC equipment) program testing and, ideally, program specification writing.

In addition to the skills you bring with you, you will subsequently acquire others—in particular on micro-computers (including SIRIUS and APRICOT). The systems you will be developing will be both batch and on-line.

VAX/VMS
PDP-11/RSTS
COBOL
BASIC

To apply for these and other positions, please contact Joan Ainsworth on 01-681 8317 or write to her at Computer Search & Selection, 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey, CR0 9XF.

Computer Search & Selection

هذا من الأصل

Our client is a long established British company with an enviable reputation worldwide for engineering excellence. With the production of over 100,000,000 precision components each year, they rank as a major force in the automotive world and their products are used in nearly every make of vehicle in virtually every country in the world in addition to other sectors within the industry.

With the introduction of a broad-based 5 year DP strategy, this company is dedicated to information technology which includes the latest in developments: CAFS, NETWORKS, Office Automation, CAD, etc.

Central to this, is the recruitment of a Senior Systems Analyst who will be able to draw on experience gained in the areas of Sales Order Processing, Invoicing, Production Planning, etc.

The candidate's age will not be a barrier as maturity of character will be a positive asset. As this is a development position, candidates will need to demonstrate written and oral communication skills, as well as the ability to deal with users at all levels. This is a key position and will offer considerable variety and scope for personal development.

For further information and an informal discussion please contact **Marshall Cligman** at the London number below or in the evenings at EPPING 76085

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c£12,000

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(8323)

RESOURCES INTERNATIONAL

CONTRACT SELECTION

LONDON & THE SOUTH

IBM Requirements

Business Analysts	All areas	
Analyst/Programmers	IMS, DB/DC	COBOL
Analyst/Programmers	CICS, DL/1	COBOL
Analyst/Programmers	MANTIS	COBOL
Programmer	MVS	PL/1
Programmers	MVS	FORTRAN
Analyst/Programmers	System 38	RPGIII
Analyst/Programmers	MVS	JACKSON COBOL

ICL Requirements

Designers	IDMS	
Analyst/Programmers	IDMS, TPMS	COBOL
Programmers	System 25	

Other Requirements

Analyst/Programmers	DEC, VAX-Datacomms	ASSEMBLER
Programmer	WANG	RPGII
Programmer	WANG	COBOL
Programmers	DG	FORTRAN
Programmer	DG, AOS	ASSEMBLER
Programmers	UNIVAC 1100, DMS	COBOL
Programmers	UNIX	COBOL
Programmers	Micro	RM COBOL
Programmer	GSX	Basic FORTRAN
Analyst/Programmer	FOCAS	

MIDLANDS & THE NORTH

IBM Requirements

Business Analysts	Purchasing and/or costing	
Programmer	System 38 MAPICS	RPGIII
Analyst/Programmers	DOS, CICS, DL/1	PL/1

ICL Requirements

Analysts	ME29, TME, RAPID	
Analyst/Programmers	ME29, TME, RAPID	COBOL

Other Requirements

Analyst/Programmers		CORAL
Programmer	APPLE, CPM	DBASE2
Programmers		RTL2
Database Administrator	UNIVAC 1100, DMS	
Programmers	UNIVAC 1100	COBOL

Call Cathy, Alistair, Chris or Debra
for a confidential discussion
01-831 6405 After hours 01-435 5466
We try hardest!

Resources International Ltd, 18-19 Sandland Street, Bedford Row, London WC1R 4LL

RESOURCES INTERNATIONAL

PERMANENT SELECTION

Anal/Progs City to £16,000 + mortgage subsidy
Three of our banking clients are seeking applicants with System 38 RPG III backgrounds along with a minimum of two years' banking experience, for involvement on a large range of development projects. These are excellent opportunities. Solid 34 people will be considered.

Programmers W.3. to £10,000
A minimum of 18 months' experience is required in an IBM installation plus a solid COBOL or ASSEMBLER background for the opportunity to work in this progressive environment on a large variety of development projects. Very good career advancement.

Consultants & Sen Anal/Progs S.E.1. to £15,000+perks
Our client is seeking candidates for a number of senior positions ranging from Technical Consultants with in-depth knowledge of COBOL on both IBM and ICL mainframes, to Specialists in Personnel, Payroll and Financial Systems (in-depth knowledge of computers not essential), to provide services to major accounts. Successful applicants will receive a basic salary between £10,000-£15,000 plus BUPA, Life Assurance and bonus. Opportunities to travel to the USA and Middle East.

RPG II or III Progs & Anal/Progs All Areas £Neg
We have a large number of clients offering solid salaries and promotion prospects for individuals with a minimum of two years' experience.

UNIX Experience E.8. to £15,000
The advanced systems division of an international systems and software engineering company is seeking a number of Systems Designers and Software Engineers/Programmers to work at their Software Laboratory in the development of various products for the financial markets. On-going training given.

IBM COBOL Progs & Analyst/Progs All Areas £Neg
We currently have a wide variety of positions for people wishing to advance their careers in companies with good prospects for the right individuals.

IBM PC Systems Analyst E.1. to £15,500
A major brewery company wishes to recruit an individual with IBM PC experience to provide services to their central function and regional company. Good communications and user experience essential.

Systems Analyst Croydon £10,400+mortgage
If you have 4+ years' experience with IBM 4300, DOS/VSE, CICS and COBOL background, our client would be interested in telling you more about the development work in their insurance environment.

Recruitment Consultant W.C.1. £Neg
We are currently seeking an enthusiastic individual to complement our small but successful permanent team. Ideal for workaholic looking for a return on his or her effort.

Call Sue Newman
for a confidential discussion
01-831 6405 After hours 01-435 5466/1584
We try hardest!

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Our reputation and indeed our success has been built on extreme sensitivity to market requirements, the highest technical expertise and attractive pricing.

Product lines include: Modems, multiplexors, Data exchange switches, L.A.N.s Network Access modules and our new 32-bit super mini to provide the solution to large corporate networking problems. We expect this latest product to boost company growth far beyond the current 80% p.a.

You will have a first class record selling to computer users or selling a technical product (photocopiers, components), and will wish to join a company where effort and salesmanship are rewarded by extremely high earnings and rapid career development in a dynamic organisation. Basic salaries are excellent and our top salesmen are earning in excess of £45,000 p.a.

A technical/computer background is desirable but not essential as our most successful people are those with the highest level of salesmanship. In short, we're looking for tough cookies.

For further information and an application form, please telephone our consultants Mike Reynolds or Craig Millar, or simply clip and return the coupon below. Tel. 01-637 9611

On target earnings in excess of £36,000 + 2L car and substantial guarantee

Telephone 01-637 9611
Suite 201/8 Albany House, 324 Regent Street, London W1R 5AA
MANAGEMENT & EXECUTIVE SELECTION.

NAME: _____ HOME TEL: (____) _____
ADDRESS: _____ WORK TEL: (____) _____

(8373)
Send to Management & Executive Selection, 201-208 Albany House, Regent St, London W1 *Ref M.S.T.*

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We are one of the Gulf's leading third party maintenance companies, with contracts across a wide range of commerce and industry. Continued success has led to an opportunity for a number of enthusiastic and self motivated individuals to work on the following range of equipment.

NATIONAL ADVANCED SYSTEMS – AS5/AS 5000 and associated IBM/IBM-compatible peripherals (experience on IBM 370/158 will also be considered for these positions).

IBM – 43000 series and associated peripherals.

DEC – PDP11 and/or VAX series and all associated peripherals.

These positions will initially be based in Riyadh – the cosmopolitan captial of Saudi Arabia.

Engineers with a minimum of four years experience on any of the above equipment, can expect the following excellent package:

- *Married or single status*
- *30 days paid leave*
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- *Yearly renewable contracts*
- *Tax free salary*
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- *Car*
- *Excellent career opportunities*

If you have the ability to work with the minimum of supervision, the drive to become a team leader and are looking to secure your financial future, contact our appointed consultants for further details and an informal discussion on 01-637 9611 and ask for Steve O'Brien or Chris Bond.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

SYSTEMS AND PROGRAMMING

PL/1 £8-12,000

Internationally renowned marketing firm on the Middlesex/Berkshire borders requires an analyst/programmer with around three years' IBM PL/1 experience to take a leading role in their team. They utilise DOS/VSE, CICS and DL/1 and you would be developing a range of on-line sales and marketing applications, liaising with users on a regular basis and writing specs. Benefits include annual bonus. I also have positions in London, Surrey, Middlesex and Kent for programmers with 18 months+ PL/1, offering excellent career progression, relocation expenses, etc. CW/1741

IBM ANALYST/PROGRAMMER To £12,000

My client has recently moved to North West Middlesex and houses an IBM 4341 under DOS/VSE, VM/CMS with CICS. They require analyst/programmers who wish to strengthen their analysis skills from both a technical and business point of view. If you have two years+ IBM COBOL, DOS/VSE, preferably with some CICS and VSAM, then I would like to tell you about this outstanding opportunity in a progressive and expanding organisation. CW/4166

RPG III PROGRAMMER CITY £11,000

My client, a financial establishment in the City, is looking for a graduate programmer with around two years' RPG III experience gained in a financial environment. In return a very attractive salary is offered together with the chance to gain analysis exposure and user contact in a small but efficient D.P. department. If you are looking to increase your financial rewards and gain new skills, please contact me now. AW/4256

ANALYST/PROGRAMMER LONDON c.£11,500

An integrated manufacturing, marketing and sales company in Central London is looking for an experienced analyst/programmer to work on an IBM System 34. The position reports directly to the DPM and requires a flexible person to develop new integrated information systems and see them through to implementation. If you have RPG II programming experience, and some exposure to analysis, with an innovative mind, then this company offers a high salary and many fringe benefits. AW/3017

ICL ME29 PROGRAMMERS, ANALYST/PROGRAMMERS LONDON To £12,000

This prestigious financial concern are currently looking to recruit a number of D.P. professionals to enhance their present team. They wish to hear from candidates with relevant ICL COBOL experience and knowledge of either TPS, MIS or finance. You will NOT be joining a maintenance team, as there are a number of new development projects underway. So if you have worked on a major development system and have genuine experience of on-line work this company offers excellent prospects. EW/4000

ICL PROGRAMMERS/ANALYSTS – MANAGEMENT OPPORTUNITIES LONDON £8,000 To ??

There are currently a number of vacancies within this well-known ICL company for ambitious and talented applicants, with an integral and active role to play, on a variety of ICL hardware. This includes Dual 2960 and a number of locations with DRS20s. The development work is in COBOL and FILETAB with CP/M on the smaller machines. You will be working in a friendly department on a variety of dynamic and operational systems and must be highly motivated. Lots of user contact and sound promotion prospects. EW/4094

'DEC' SKILLS ARE WANTED To £11,000

Based on the Middx/Berks borders, this expanding Systems House is seeking to recruit three Analysts/Programmers with good DEC skills. You will play an integral part in a small-team environment, developing systems in a variety of areas to high standards. To qualify you must have ability in one of the following: RSX-11-M, FORTRAN, BASIC+/+2, VAX/VMS, in either scientific or commercial applications. Training is offered in other areas and you will be encouraged to deal first-hand with the client and become involved in analysis. HW/4399

DEC PROGRAMMERS To £8,500

If you can offer six months+ commercial programming experience in a RSTS/E, BASIC+ environment, my London based client can offer you the chance to further your career and update your knowledge. This large financial organisation currently houses a DEC/PDP but will be taking delivery of VAX machines in the next few months. Full training will be provided on this machine, and also in the analysis and communications areas. There is much development work planned. Benefits include B.U.P.A., L.V.s and a generous yearly bonus. HW/4392

SYSTEMS ANALYST CITY To £14,000 + Mortgage

This leading financial organisation requires a Systems Analyst with two-three years' experience in analysis and a background in on-line systems development within an IBM Hardware and Software environment. The candidate appointed will be responsible for performing data-gathering investigations in user departments, implementing and developing systems, and the supervision of system testing and staff. Excellent benefits which include Subsidised Mortgage. GW/6780

SENIOR PROGRAMMER HERTS £9,000+

This international manufacturing company based near the M1 in Hertfordshire, run IBM 3083s with CICS and DL/1. They are looking for a programmer with 18 months+ IBM COBOL and some on-line and database knowledge. They offer excellent training, the chance to develop your analytical skills, and utilise your talents and ideas to the full. If you are young and ambitious and feel that you would fit into a team environment working on development and maintenance projects, this could be the job for you. AW/4325

DATAPOINT UNLIMITED OPPORTUNITIES CITY/BERKS £10-12,500

My client is a prestigious UK financial services organisation with worldwide links. Due to continued expansion they now require talented analyst/programmers with good Datapoint/Databus experience for several major interesting development projects. Career progression opportunities are unlimited and if you prefer to specialise in a certain area you will be given every opportunity to do so. People with the skills and ambition to work in this fast growing and challenging environment will be rewarded with an excellent package and first-class working conditions. MW/4356

MINI COBOL ESSEX £10,500

My client, a well-known household name, urgently seeks an "above average" COBOL programmer. They currently utilise B800 minis and are in the middle of upgrading to B900s. Burroughs experience would certainly be an asset, however the company invite applications from self-motivated individuals with a solid commercial background and a minimum of 18 months' COBOL experience. The work itself involves interesting development plans and enhancements to existing systems. This company also houses IBM Hardware and as all vacancies are advertised internally the opportunity to remain on IBM will be available to you. First-class benefits include flexitime, subsidised restaurant and profit share. MW/4461

ANALYST/PROGRAMMER SUSSEX c.£10,500

An opportunity has arisen for an analyst/programmer with a minimum of two years' IBM COBOL and sound analytical experience. The installation is an IBM 4331 with a wide range of systems under development and significant expansion on the on-line network using CICS and DL/1. The company believe they can offer a rewarding career path as the main concentration is on systems development. The position carries benefits normally associated with a large company. GW/4376

IBM SYSTEM 38 WEST END To £11,500

My client, an international consumer products group, now has openings in their D.P. department for an experienced programmer and analyst/programmer both with an RPG III background. This is an expanding department therefore the candidates appointed can expect career progression as the main emphasis of the positions will be the implementation of new systems. To discuss these positions further please contact me as soon as possible. GW/4349

HONEYWELL PROGRAMMER/ANALYST DEVELOPMENT. EXCELLENT TRAINING MIDDX To £14,000

This well established system house is looking to recruit a number of additional highly motivated staff to enhance its present dedicated but small, informal teams. If you possess a proven programming background with two years' experience, of which at least 12 months has been on Level-6, DPS6 with COBOL and/or Screenwrite and wish to join a fast, stimulating environment you will be well rewarded. The company offer good training and a career development. EW/2469

IBM SYSTEM 38 WEST LONDON c.£12,000

My client is an established consumer group with a household name. They house a range of hardware including IBM Mainframes and System 38, and are seeking a programmer/analyst with two years+ experience, and at least a year of RPG III on IBM System 38s to join a small development group. They offer the opportunity to exploit your ideas and enhance your skills with further training, user contact and a degree of responsibility, coupled with a full range of company benefits. CW/2161

MICRO PROGRAMMER NEW PROJECT LONDON £10,000

This major British organisation has recently organised their D.P. department to support the use of Microcomputers. The company utilise a wide range of Micros from a 32-bit machine to the BBC. They require a self-motivated person to join a small team, initially specialising in the development of Microcomputer software to assist in the problems of data communications across a fairly wide range of hardware. Experience of one or more of the following is required: 280 Assembler, CP/M, MS/DOS UNIX, X25, SWA, BSC. In return the right candidate will be offered excellent long-term career prospects and a full range of benefits. MW/4400

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Senior Analyst/Programmer. European Travel. £14,000 Berks.
D.P.M. Aged 30+. 10 years+ good HP 3000. £20,000 Berks.
Analyst/Programmer. Lots of development. £11,500 Herts.
Project Leader. Great prospects! £15,000 + Car Beds.
Analyst/Programmers. Manufacturing exp. £13,500 Essex.
Systems Analyst. Knowledge of IBM. Management prospects. £13,500 London.
Programmer/Analyst. Exciting applications, lots of analysis: £12,500 W. London.
HW/1610

These are just a selection of the positions we have available in London and the Home Counties. If you have 12 months+ experience in systems and programming on any machine, we would like to hear from you.

Brushfield House, 12 Brushfield Street
Bishopsgate, London E1 6AN.
Telephone: 01-247 3356 (24 Hours)

ENGLEDOWN

COMPUTER PERSONNEL CONSULTANTS

(M11)

OECD OCDE

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Headquartered in Paris, the OECD is a major international Organisation collecting and processing large volumes of economic data.

To respond to the growing demand for information processing services from economists and statisticians, the Organisation is currently seeking two high-level professionals for its Computer Operations Division.

DEPUTY OPERATIONS MANAGER

Responsible for the planning and supervision of the daily operations and maintenance activities for the Organisation's Burroughs and IBM computer installations, the successful candidate will have a :
- degree in data processing or other relevant discipline ;
- minimum of 5 years data processing experience in an interactive environment with a large community of users ;
- proven ability to coordinate and supervise the work of staff of several units and liaise with equipment manufacturers.

(Réf. WEEK (83)39)

DATA COMMUNICATIONS ANALYST

Reporting to the Head of Systems Software, the appointee will be responsible for the installation and maintenance of several Burroughs and IBM networks and for the development of the communications software.

The successful candidate will have a :
- degree in data processing or other relevant discipline ;
- minimum of 4 years pratical experience in data communications ;
- expertise in : standard communications protocols, European standards for local area and international networks, and good knowledge of communications software.

Familiarity with burroughs data communications and software is desirable. (Ref. WEEK (83) 33)

Attractive salaries and excellent benefits are offered.
Work will be carried out in Paris but occasional travel might be necessary.
Vacancies open equally to both male and female candidates.

Applications from nationals of member countries, together with detailed CV form in english or french and specifying the chosen post should be sent to : Personnel Division OECD 2, rue André Pascal 75775 PARIS CEDEX 16

(8304)

STROUD – IN THE COTSWOLDS

ANALYST/PROGRAMMER

to be responsible for maintaining existing systems and developing new systems to run on an IBM System 34.

The successful applicant must have proven experience of RPG II programming and the ability to understand, analyse and react quickly to user requirements. Solid experience is more important than academic qualifications and a working knowledge of engineering and financial systems in a manufacturing environment will be of help.

We are an international leader in Mechanical Handling Engineering and the successful applicant, who must have a versatile approach, will report to the Systems Manager.

SALARY NEGOTIABLE

Please apply with full details to:
The Personnel Officer, Redler Conveyors Limited, Dudbridge, STROUD, Gloucestershire GL5 3EY. Tel: (045 36) 3611.

(8408)

☆ WORKSHOP SUPERVISOR ☆
TO £12K + XR3

Our client is one of the leading manufacturers of multi-user, multi-tasking, small business systems.
They urgently require a Workshop Supervisor for new, purpose-built premises in London NW1. Responsibilities include supervising the workshop and associated bench and commissioning engineers, technical support and all necessary paperwork, fault finding and repair to component level on systems running under CP/M and MP/M with Winchester and floppy drives, daisywheel and matrix printers, etc. Excellent prospects in an expanding environment with a salary to £12K + XR3 and all usual big company benefits. Don't delay, ring today. Ref. EM175.

(8380)

ab executive (kingston) ltd
59 Eden Street, Kingston-Upon-Thames, Surrey. Tel: 01 549 6441 (24 hrs)
Specialists in Computer Sales

TELECOMMUNICATIONS UP TO £14,000

SPECTRUM DATA SERVICES is a rapidly expanding telecommunications consultancy. We are involved with the planning/implementation of voice/data networks both nationally and internationally.

We are looking for:
★ CONSULTANTS/TECHNICIANS BASED IN SURREY
★ A TECHNICIAN TO WORK FOR ONE OF OUR MAJOR CLIENTS BASED IN ESSEX

Applicants should be prepared to travel within Europe and have a minimum of 3 years experience in the telecomms field. Ideally they should be educated to at least ONC level but applicants with the appropriate experience will be considered.

Please write for an application form to:

SPECTRUM DATA SERVICES LTD
201-205 Kingston Rd
Leatherhead
Surrey KT22 7PB
Tel. 0372 377819

(8349)

THORN EMI Electronics Defence Systems Division, a leader in the fast-developing defence industry, is undergoing a period of sustained growth at its attractive Woking location. We currently have an opportunity for a

Real-time Programmer

to work in a small team designing real-time software for underwater acoustic tracking systems, using PDP11 or HP1000 computers. The work will involve module design, coding, test and commissioning.

The projects involved will make use of FORTRAN, PASCAL and Assembler, and either RSX11 or RTE-A.

If you feel that your previous experience fits you for this task, send your cv to Janet MacLeod at THORN EMI Electronics Limited, Defence Systems Division, Albert Drive, Sheerwater, Woking, Surrey GU21 5RU.

(8412)

THORN EMI Electronics Defence Systems Division

PROGRAMMER/ANALYST – YORKSHIRE

To meet growing demands for systems development we require an additional experienced Analyst Programmer.

The person appointed will join a small team involved in all phases of programme development and is likely to have:

★ Two years' COBOL programming experience
★ Knowledge of Data Base Management and Communications Systems
★ Current driving licence

The company is a member of Hepworth Ceramic Holdings PLC and is the world's largest manufacturer of vitrified clay underground drainage systems and cable conduits. The successful candidate will be employed at the headquarters of the company which is situated in a rural location eight miles from Huddersfield and 15 miles from Sheffield.

CV details to Computer Manager:
The Hepworth Iron Company Limited
Hazlehead, Stocksbridge
Sheffield S30 5HG

(8230)

Hepworth

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SURREY £9-13k

This is your chance to help develop a new, integrated cockpit system – then make it work in FLIGHT TRIALS on one of the company aircraft! Expand your experience using 16-bit micros, VAX, LANs and PASCAL – with a leading name in innovation. If you are well qualified and have good REALTIME SOFTWARE experience then get your career airborne TODAY.
Call me, Vincent Melling, NOW on 01-549 6441 (24 hours) – for further details. (8438)

ab executive (kingston) ltd
Specialists in Real-Time

TECHNICAL SUPPORT
C. £12,000

Update Computers, a young and expanding systems house, is looking for a capable and experienced person to be responsible for providing hardware support and to help in the further development of its systems.

Applicants should be experienced in maintaining microcomputers, hard disks and other peripheral equipment down to board level. Experience with local area networks would be an advantage.

A successful person could look forward to a larger role within the company.

Present systems are based upon the IBM PC.

Benefits include 5 weeks' annual leave, a non contributory pension scheme and a private health scheme covering the applicant's family.

Central London location.

Contact: Amanda Naylor
Update Computers Limited
33-34 Alfred Place
London WC1E 7DP
Tel: 01-637 4544

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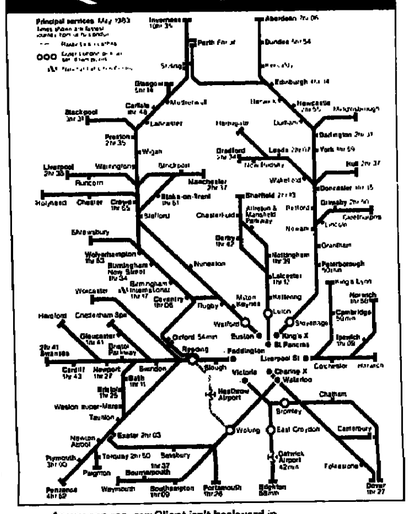
DISTRIBUTED NETWORK

InterCity Services



No-one has done more than our Client to apply microprocessor-based hardware and software techniques to railway signalling and information systems.

One of their latest developments demonstrates their technical approach, and says a lot about the company as well.

It's a micro-based train describer system that gives signalmen a clearer, more detailed picture of exactly what's happening where on all the route miles under their control.

To develop the system, our Client's engineers designed their own microcomputer units, based on the Intel 8088, and then configured them into a highly ingenious distributed network.

While the hardware specialists were perfecting their own micros, the software people were using the Company's 2 Mbyte VAX 11/750 to develop an equally specialised distributed operating system which routes individual processes via a low-speed asynchronous ring.

It was a typical project for our Client's Electronic Systems Department — technically challenging, but small enough to give everyone a real sense of involvement and achievement.

It's also typical of the projects you could be handling as one of the additional men and women our Client now needs as a direct result of sustained expansion in railway and mass transit systems markets throughout the world.

Development Engineers c.£10K-£14K

You'll have a degree or equivalent in electronics, computer science or a closely related discipline. Your experience — as little as a year, or three years for senior appointments, will have been in a microprocessor-orientated development environment and will have given you a useful knowledge of digital logic techniques, using both ICs and discrete components.

Programmers c.£10K-£14K

Maths, computer science, electronics or a closely related discipline will be your degree (or equivalent) subject; real-time systems will form the basis of your experience, which could range from a year, to a minimum of two years for senior roles, for which you'd need design as well as implementation experience. You'll need a knowledge of at least one high level language, such as ALGOL 60 or PASCAL, and at least one microcomputer assembler language. Finally, you should be familiar with the concepts of structured programming and top-down approach to systems design, and have worked with Intel microprocessors.

As you can see, our Client isn't backward in coming forward where money is concerned — nor on the subject of benefits, which include relocation assistance (although if you live to the North of London you won't find travelling a problem), and the very real advantages of flexible working hours.

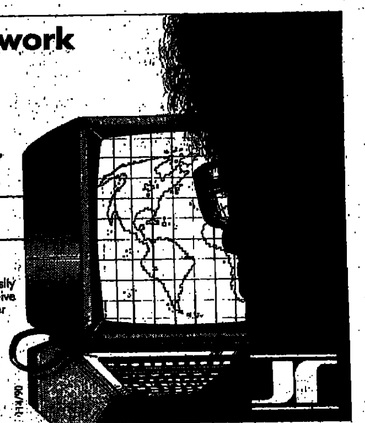
A phone call on 01-437 9261 ext 218 between 10 a.m. and 6 p.m. today and tomorrow will bring a swift response with detailed information about the Company, the jobs, and what the future could hold for you in an applications area that has huge worldwide potential. Even outside these times you can still get the application process moving by leaving a message on our 24-hour answerphone (01-439 3410).

Alternatively, you could write briefly to Confidential Reply Service, Ref. ASD 8950, Austin Knight Advertising Limited, London W1A 1DS.

Austin Knight Advertising

(8362)

Our worldwide computer network is looking for conceptual brains



As an international corporation, operating a computer based worldwide banking telecommunications network, we are now developing our second generation system, enabling more performing services and launching of new products.

Therefore, our R & D department requires

highly creative software specialists (m/f)

to participate, within a project team, in specifying, design and implementation of the coming network system.

This is a job for experienced (at least 5 years) software specialists with a solid university background (Polytechnician, civil or commercial engineer) and a strong drive to conceive highly sophisticated large scale network systems. Fluency in English is essential, other languages are a definite advantage.

Our company offers these outstanding career opportunities in a young international team with an excellent working environment and a very good financial package.

Please submit your detailed résumé and photo to our consultants:
Jerry RUBIN - Personnel Consultant, c/o Trade Showrooms, Avon House
360-366 Oxford Street, W.1.
First interviews will take place in London.
All applications will be answered. Absolute discretion is guaranteed.

(8388)

06/84

Systems Programming

Salary to £11500

We are a well established and highly respected Company with a substantial and innovative history of Data Processing activity. As such we are fully aware of the need continually to appraise the benefits available from modern technology.

We are based on the Staffordshire/Derbyshire border, in an area which offers the dual benefits of beautiful countryside and access to the shopping centres and nightlife of several large towns close by. Housing is plentiful and inexpensive and excellent sporting and cultural activities are within easy reach.

Our Data Processing configuration comprises a large IBM compatible mainframe, currently running MVS, CICS and a TSO equivalent, supporting an extensive 3270 telecommunications network. However, we are reviewing carefully our level of MVS and are actively planning the introduction of VTAM.

Staffs/Derbyshire Border

You will need to be already employed in a systems programming environment and will be required to demonstrate previous experience, together with a sound understanding, of either MVS or CICS. As VTAM features in our future plans, a knowledge of this would obviously be advantageous.

The comprehensive remuneration package includes pension, Life assurance cover, 24 days annual leave and full relocation where appropriate.

If you can relate to this challenging opportunity, contact **Jim Mitchell** on **021-236 3781** (24 hour answering service) or at home on 021-427 2291 (evenings and weekends until 9.00 p.m.).

You are assured of a prompt and confidential interview.

Technical Sales & Management Appointments

(8388)

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01-935 0871/468 0461	021-236 3781	061-833 0427	010 322-640 7161/71	010 3120-760947

DP

then you've got to be interested in the career opportunities offered by our client, a multinational manufacturer of electrical and electronic components, rapidly moving into advanced manufacturing and information systems.

The company is expanding its DP team in Amersham which provides support for user sites throughout Europe, and requires —

SENIOR ANALYST PROGRAMMER

c.£13k

ANALYST PROGRAMMER

c.£12k

Plus Performance Bonus and outstanding benefits package including excellent relocation assistance where applicable.

All positions demand —

- fluency in **RPG II**
- experience of **IBM System 34**
- sound commercial background

and knowledge of manufacturing systems would be advantageous.

The senior position requires candidates who have designed and implemented a major system, and who are able to lead and train others.

But these are not jobs for backroom boys. They're exciting opportunities for dynamic DP professionals who can communicate at all levels, who are versatile and resourceful, and who enjoy demanding work liberally spiced with European travel.

DP

you feel you've climbed all the mountains in your current job, phone us. Now. At our Office —

Redbourn (058 285) 3888.

Or contact
Sheila Stacey,
Milton Keynes (0908) 542274
Lionel Elton, Amersham (02403) 6106
Wendy Wyatt,
Redbourn (058 285) 4476
After office hours.

The computer consultancy consultancy

PERMANENT SYSTEMS & PROGRAMMING

SYSTEMS ANALYST
CITY **UP TO £14,000**
A minimum of three years' experience as a Systems Analyst which should include some formal training. Familiarity with on-line systems, IBM hardware and software. A knowledge of Insurance or Re-Insurance would be an advantage.

SYSTEMS PROGRAMMER
EUROPE & SAUDI ARABIA **£18,000++**
Four years' extensive MVS systems involvement with knowledge of SNA and/or other telecommunications systems. The successful applicant will be working mainly on overseas assignments for a UK based software house.

PROGRAMMER
LONDON/ESSEX BORDERS **£NEGOTIABLE**
Strong UNIX experience combined with a good knowledge of the 'C' programming language is required by a highly professional software house. Development and ongoing support of commercial applications for the self-motivated individual.

ANALYST/PROGRAMMERS DOS/VSE
MIDDLESEX **TO £12,000**
Experience of CICS and COBOL of at least three years is required by this large international organisation. Knowledge of MANTIS will be a distinct advantage, however, as this is not a major criteria, training will be provided for the successful applicant.

PROGRAMMERS VM/CMS
BUCKS **£NEGOTIABLE**
Strong IBM COBOL programmers of at least two years' standing, VM/CMS experience. If you have this background and are highly self-motivated with a proven track record you could be the person this well-known and highly successful manufacturing company is looking for.

01-439 7871

CONTRACT SYSTEM & PROGRAMMING

IBM	SYST 38 RPG III	ANALYST/PROGRAMMERS	ICL	DRS CIS COBOL	PROGRAMMERS
IBM	SYST 34 MAAPICS	ANALYST/PROGRAMMERS	ICL	TPMS/IDMS	DESIGNERS
IBM	IMS DB/DC COBOL	ANALYST/PROGRAMMERS	VAX	COBOL BANKING	ANALYST/DESIGNERS
IBM	IMS DB/DC PL/1	PROGRAMMERS	VAX	VMS COBOL	PROGRAMMERS
IBM	PL/1 ADABAS NATURAL	ANALYST/PROGRAMMERS	PDP	AIMS	ANALYST/PROGRAMMERS
IBM	PL/1 MVS	ANALYST/PROGRAMMERS	PDP	MUMPS	ANALYST/PROGRAMMERS
IBM	CICS SHADOW PL/1	ANALYST/PROGRAMMERS	PDP	CORAL 66	PROGRAMMERS
IBM	CICS DL/1 COBOL	ANALYST/PROGRAMMERS	UNIVAC	1100 COBOL	PROGRAMMERS
IBM	CICS DL/1	ANALYST	UNIVAC	1100	ANALYST/DESIGNERS
IBM	PC FOCUS	ANALYST/PROGRAMMERS	UNIVAC	1100 + AIRLINE APPL.	ANALYST/PROGRAMMERS
IBM	MK IV	PROGRAMMERS	HP 3000	IMAGE COBOL	PROGRAMMERS
IBM	FORTRAN	PROGRAMMERS	TI 990	BASIC COBOL	PROGRAMMERS
IBM	UNIPAY	ANALYST/PROGRAMMERS	TANDEM	COBOL	ANALYST/PROGRAMMERS
IBM	ENQUIRE	ANALYST/PROGRAMMERS	UNIX	'C'	PROGRAMMERS
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IBM	8100 DPPX/DPCX	ANALYST/PROGRAMMERS	OVERSEAS		
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HONEYWELL	COBOL DM4	ANALYST/PROGRAMMERS	ICL	VME/B KUWAIT	TECH. SUPPORT
ICL	ME29 TP8 COBOL	PROGRAMMERS	ICL	VME/B KUWAIT	ANALYST/PROGRAMMERS

01-439 7871

Our requirements are constantly changing – if your skills are not listed above you may still have the experience we require. Telephone us as we are always pleased to offer advice and to discuss how we can help you.

datascene

Datascene International Limited
Sceptre House 169-173 Regent Street London W1R 7FB
Telephone: 01-439 7871 Telex: 25851

(8408)

We're bringing our jobs to you.

We are coming to your doorstep because we're an energetic Company not content to stand and let things happen. We are prepared to go out and get what we want — YOU!

The last few years have consolidated our position as a leading manufacturer in the commercial real-time computer field. We are now building on this and expanding: our product ranges — our marketing base — our field of operations.

Meet the challenge of some of today's most stimulating opportunities and help us to achieve even greater success in the forefront of tomorrow's technology.

Right now we seek wide ranging skills for **Wythenshawe**, South of Manchester and Programmers and Designers for our **Aberdeen** office.

Come and meet us for an informal chat in a friendly atmosphere and find out why we think you should now come to us.

FERRANTI
Selling technology

Programmers
Relevant skills include any of the following: CORAL 66, FORTRAN, 'C', PASCAL, ASSEMBLERS, UNIX, ZRTS, MTOS, CPM, MSDOS.

Systems Designers
Design experience in micro-processor based products; real-time information and communications systems or process control.

Hardware Designers
Experience of modern computer architectures and technologies.

Technical Authors
Skilled in designing technical and user documentation for products and large scale projects.

Technical Support
To provide customer support of high technology software products.

Project Engineers
Ability to configure equipment for a variety of systems and liaise with outside sub-contractors.

ATE Programmers
To design test programs for automatic test equipment on new hardware development.

Sales
With a proven track record in sales or sales support OR relevant experience of process control, communications, or terminal systems.

Now meet the people from Ferranti Computer Systems.

Members of the Wythenshawe team will be available for informal discussion between 4.00 pm and 9.00 pm at various locations throughout March.

Bristol	Monday, 19th March Ladbroke Dragonara Hotel, Redcliffe Way
Birmingham	Monday, 19th March Computer People Midlands Alpha Tower
Liverpool	Tuesday, 20th March Atlantic Tower Hotel, Chapel Street
Manchester	Tuesday, 20th March Crest Court Hotel, Church Street, Altrincham Thursday, 22nd March Computer People North Sovereign House, Cheadle
Newcastle upon Tyne	Wednesday, 21st March Crest Hotel, Newbridge Street
Nottingham	Wednesday, 21st March Albany Hotel, St James Street

See local press for more details.

If you are unable to attend but would like to know more, contact our Recruitment consultants and ask for Graham Pepper on 061-491 1666 (daytime) or Adlington (0257) 480291 (eves/wknds). Alternatively, write to him at Computer People North, FREEPOST, Sovereign House, Stockport Road Cheadle, Cheshire, SK8 2YD.

VLI Computer People North

01-636 8411 Computer People London, VLI House, 68-69 St Martin's Lane, London WC2N 4JS 01-680 4413 Computer People South, 27 George Street, Croydon CR0 1LB 021-643 8501 Computer People Midlands, Alpha Tower, Birmingham B1 1TT 061-491 1666 Computer People North, Sovereign House, Stockport Road, Cheadle, Cheshire SK8 2YA 01-836 8411 Computer People International, VLI House, 68-69 St Martin's Lane, London WC2N 4JS 01-836 8411 CoOperators, VLI House, 68-69 St Martin's Lane, London WC2N 4JS 021-643 8722 Sales People, Alpha Tower Birmingham B1 1TT also offices in New York, Kentucky and Los Angeles

The Market Leaders

SMR
Sales & Marketing Recruiters Ltd
WITH TECHNICAL SUPPORT PEOPLE LTD.

SALES EXECUTIVES
FREEDOM TO BREATHE, ROOM TO GROW!

Many sales people never reach their full potential, because they are constantly frustrated by executive whim or stifled by corporate edict. How nice it is, therefore, to make available such jobs as these in

SOUTH EAST ENGLAND
and the
WEST MIDLANDS

that not only provide a 'ground-floor' opportunity within a fast growing and progressive organisation, but which also gives the individual salesperson freedom of action, scope for creative selling and real involvement in shaping the destiny of the company.

Our client is a well established name in both minicomputer based turnkey systems and computer terminals and has secured some 25% of a specialist market. Such is the success, that all of their existing salespeople consistently achieve target. This is most likely due to the company's unusually high investment in advertising.

We are seeking three accomplished salespeople; one with significant experience of selling DEC based commercial and industrial **Turnkey Systems** up to a value of say £200k, and two with a good track-record of selling **Computer Terminals**. In the former case, a pre-sales support analyst would also be considered. In the latter case, some exposure to DEC equipment will be advantageous, but not imperative. Whereas, a proven ability to communicate at a senior level, is essential.

An attractive compensation package is negotiable, including a company car and a variety of fringe benefits.

Please contact Lindsay Howie (London), or Roger Dodd (Midlands), quoting reference HSC/024.

(8331)

LONDON & SOUTH
29 Oxford Street,
London W1. (01) 734 9776

MIDLANDS & NORTH
Cathedral House, Beacon Street,
Lichfield, Staffs. (05432) 56612

Answering Service after 6 pm and weekends
SALES TRAINING. MARKET RESEARCH. RECRUITMENT

Nuclear Enterprises design, manufacture and market nuclear radiation detectors and systems for physics and life sciences applications.

The Company is established as a world leader in these fields and owers its position to a continuing investment in its development and R and D programme.

A vacancy now occurs in our Edinburgh Laboratories for a

SOFTWARE MANAGER/ SPECIALIST

Reporting to the Technical Manager, the successful candidate will be responsible for a small software department. The job combines development of new software with technical support and requires interaction with colleagues in both marketing and production departments of the Company.

Candidates should hold a degree in Computer Science or a related discipline and have a minimum of six years' experience of software development. This should encompass experience in RSX – 11M – PLUS and in particular with device drivers together with a working knowledge of FORTRAN and PASCAL.

An important aspect of the job will be liaison with hardware design engineers which will require an appreciation of the hardware/software interface. The design of software packages incorporating numerical curve fitting will also be required. Supervisory experience would also be an advantage.

Nuclear Enterprises is a member of the **THORN-EMI** group of Companies and the salary and benefits package will be commensurate with being part of this large International Group of Companies.

Applicants, male or female, should apply in writing giving details of age, experience and current salary to:

Personnel Department, Nuclear Enterprises Ltd., Sighthill, Edinburgh EH11 4BY.

(8369)

UNIX SUPPORT!

London, Herts or Berks **£14K + car**

The UNIX market is buoyant! Now is the time to develop your skills – with one of the recognised companies – and increase your FUTURE career options.

APPLICATIONS – LANGUAGES – UNIX – SUPPORT

If you have experience in some of these areas and are keen to acquire more PLUS top salaries – company car – U.K. and European travel – exposure to today's top mini/micro systems – then call me Now! Ref: CA 382.

Ask for Allan Sanders – UNIX Recruitment Consultant.

ab executive (kingston) ltd
59 Eden Street, Kingston-upon-Thames, Surrey. Tel: 01-549 6441 (24 hrs)
Specialists in Technical Support

UNIX & "C" PROGRAMMERS

Immediate openings in USA for suitably qualified graduates with experience in UNIX 'C', X25 Systems. Interviews in London. Attractive remuneration.

Reply with detailed c.v. to:
BOX NO: 1299.

(8436)

BOX NUMBERS

Box number replies should be addressed to:

Box Number .....

c/o Computer Weekly
Quadrant House
The Quadrant
Sutton, Surrey SM2 5AS

SYSTEMS PROGRAMMER

PASCAL, MICROPROCESSORS

We are a company specialising in cash management processing systems utilising Intel 8086 based equipment and are presently seeking a programmer to augment our existing software department.

The ideal candidate will have a sound practical knowledge of Pascal, and be strong in Customer liaison skills.

A competitive salary together with Private Medical and Income Protection Insurance is offered plus opportunities for travel in Europe and the USA.

Please contact Len King on 01-844 1234 for further information.

(8468)

EDP MANAGER

WATFORD **UP TO £15,000**

A move into management is offered the D.P. professional with extensive COBOL programming experience in a multi-user real time environment. Reporting to the Financial Director, the EDP manager has total responsibility for the main computer installation, a new DG MV4000 replacing an Eclipse C300, and with the assistance of two operations staff, for providing EDP services to the company. Responsibilities include application systems development and maintenance, introducing new information processing methods, and working with other group companies.

With sales of £3¼ million, 140 employees, and new top management, Ealing Beck Limited, the subsidiary of a small U.S. public company, is increasingly successful in its business of manufacturing optical components and distributing them worldwide through catalogue mailing.

In this stimulating environment, the immediate task of the successful candidate will be completing the conversion of existing commercial applications to the new equipment. The next major project is to introduce new production control systems, for which experience of manufacturing systems would be a distinct advantage. If you believe you can succeed in this position, please write with details of your career to Chris Hodson, Ealing Beck Limited, Greycaine Road, Watford WD2 4PW.

Ealing **EALING BECK LTD**

GREYCAINE ROAD
WATFORD WD2 4PW
TEL: WATFORD (0923) 42261 TELEX: 935728

(8418)

Fortran Programmer

This new post in Epsom should greatly improve your form

That's true whether you're a graduate heading for the starting post or someone with one or two years' experience.

You'll be joining UIS, a leading computer services organisation with a national network of offices and a well deserved reputation for its wide ranging professional services to industry and commerce. We're well equipped to provide rewarding career paths for people who can match our pace of progress.

This job involves maintaining existing systems – on a database linked to FORTRAN programmes and developing new systems using MS DOS based micros linked to the mainframe by UIS's own communications software for screen data entry.

Initially, we can offer a salary up to £8½K, a happy working atmosphere in a very pleasant part of Surrey, and everything else you'd expect of a major organisation such as UIS.

For more information contact Moira Middleton, United Information Services Limited, United House, 56/64 Leonard Street, London EC2A 4AN. Tel: 01-253 1066.

(8410)

UNITED INFORMATION SERVICES

COMPUTER PROGRAMMER

Thorntons, the well known quality confectionery manufacturers are looking for an experienced programmer.
Candidates (male or female) should have considerable programming experience using COBOL, and familiarity with Hewlett Packard 3000 hardware would be an advantage.
We offer an attractive salary; excellent working conditions and a full range of facilities.
Please telephone or write for an application form to Executive Manager-Personnel, J. W. Thornton Limited, Derwent Street, Belper, Derby DE5 1WP.
Tel: Belper (077 382) 4181.

Thorntons (8434)

TOPS IN MICRO DISTRIBUTION.

Rapid Growth Means Rapid Advancement Means Opportunities.

Rapid Recall

Rapid Recall and Rapid Terminals are recognised as the leading U.K. distributors of Microcomputer components, boards, systems and peripherals. With offices based in High Wycombe and Nantwich our sales are exceeding £20 million per annum. Our success is based on offering our customers the best technical sales support in the Industry, and we're now looking for a number of exceptional Sales people to join our informal team.

Internal Sales Engineers – Rapid Recall and Rapid Terminals

Internal Sales is a major stepping stone for career advancement into Field Sales or Marketing. Responsibilities include customer visits and telephone interface, preparing quotations and supporting our Field Sales Engineers. Sales experience is not totally necessary and hence makes this an attractive opening for junior design engineers wishing to enter into sales.

Field Sales Engineers – Rapid Recall

Our dramatic growth has meant that new sales areas have been created into the North and South of England. Responsibilities include the sale of DEC, Intel and H.P. products and knowledge of any of these product *or* sales experience is desirable.

Digital Sales Specialist – Rapid Recall

A totally new position for a person currently selling to software houses and small OEM's. A knowledge of Digital's microcomputer range would be preferable although *not* essential.

Commercial Systems Sales Engineers – Rapid Recall

Our recent appointment as the exclusive U.K. distributor for Intel Commercial Systems has created a sales position for taking these products both into the OEM and end user market. The ideal applicant will have an appreciation of commercial systems and the IBM product.

Field Sales Engineers – Rapid Terminals

We need to fill a new position based at High Wycombe with responsibility for a fast-expanding product area that includes Digital Terminals, Envision Colour Graphics, Summagraphics. Relevant experience is necessary.

Product Manager – Rapid Recall

A new marketing position has arisen with responsibilities including product promotion planning, interface with the principals and our salesforce, stock profiling and identification of new market opportunities. An electronic or sales background plus experience with micro-based products is required.

Our success depends on the quality of our staff and, as such, we are prepared to meet the remuneration requirements that such team members require.

Rapid Recall
Rapid House, Denmark Street,
High Wycombe, Bucks. HP11 2ER.

If you feel that you might enjoy working in our team, why not ring
0494 26271
and speak to Karen Cahill.

Rapid Terminals

TOPS IN TERMINAL DISTRIBUTION.

SENIOR DP CONSULTANTS/LECTURERS

ADM Ltd, an established company specialising in high technology training within the computing environment, are currently recruiting several data processing consultants to join their successful team in providing advice and training in a wide range of DP related subjects. Based in Harrow, these posts will call for a willingness to consult and present courses in a rapidly increasing number of areas in a number of locations.
Applicants should have in-depth knowledge of systems analysis and design techniques, State of the Art microcomputers and related software packages, together with a sound knowledge of mainframe computers, particularly IBM and appropriate operating systems and software. A knowledge of structured programming techniques would be an advantage.
An attractive package will be offered to successful candidates.
Please contact Sue Barry on 01-861 0621 to arrange an interview or write to the above person enclosing a curriculum vitae at ADM Limited, Equitable House, Lyon Road, Harrow, Middlesex.

(8429)

URGENT CONTRACTS

VAX/FORTRAN/SYSTEL	NOW
UNIVAC/TIP/DMS/COBOL (USAS useful)	JUL/AUG
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IBM/MVS/IMS/CICS SYS PROGS.	APR/MAY
PASCAL (VAX or PDP 11)	NOW
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98-100 High Road, Ilford, Essex IG1 1DS
TEL: 01-553 2944 (4 lines) Emp. Agy. (8428)

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(pref with MVS & VM experience)

MVS VM (IMS) OPS Ref CW2

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(8427)

CUSTOMER SPECIALIST

£15k + CAR + BUPA + PENSION SCHEME + U.S. TRAINING

Our client, a leading manufacturer in micros, has a ground-floor opportunity in its London office to become the senior support representative. He of she will be expected to make customer visits in pre- and post-sales situations, to present the detailed benefits of our client's prestige products, evaluate problems and propose solutions whilst being prepared to modify standard software. Freedom to exercise own initiative is a key part of this position and our client will consider applicants with a view to future progression.

STOP PRESS . . . U.S. 32-bit mini manufacturer offers new opportunities in office automation – comms., etc., applications to support people with ambition!!

Call KEITH WALLIS now on 01-543 4844 or 048641 2876 (evenings/weekends)

ALLTRONICS PEOPLE (Agy.)

(8263)

TAS Computers

PROGRAMMERS FOR THE TRAVEL INDUSTRY
TRAVEL AND SPECIALIZED COMPUTERS LIMITED

THE COMPANY
TAS Computers is a London-based company which, for a number of years, has been a leader in the field of providing computer systems for travel agents, tour operators and airlines.
We have a rapidly expanding software development programme and require a number of programmers with various levels of expertise and experience to assist in accelerating these developments.

THE JOB
You will be working within one of our small project teams on highly sophisticated mini-computer systems developing interactive programs in several areas of our business.
For all posts, a knowledge of Cobol and/or assembler languages gained in a user-oriented environment will be an advantage.
For the more senior posts, experience of programming in the area of business accounting and office support systems will be desirable.

THE BENEFITS
Salary and company benefits will be made attractive to the high-calibre people who we expect to join our company. We also offer an enthusiastic and friendly working environment where you will have opportunities to show initiative and be rewarded for your efforts.

Please send full cv, including details of current salary, to: Martin Vincent, Software Manager, Travel and Specialized Computers Ltd, 141-145 Curtain Road, LONDON EC2.

(8473)

Just in time

elf

Cobol Programmer

Altrincham, Cheshire **c. £7,750 p.a. + benefits**

Elf Oil (G.B.) Limited, the Marketing Division of an international oil company, have a vacancy for a Cobol Programmer at their Head Office.

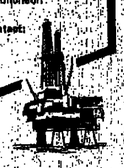
The Computer Department is small and informal utilising a Honeywell DPS6/92 (two-megabyte processor, T) to machine forms the basis for an exciting development programme using remote communications.

Applicants, in their 20s, should have at least six months' TP08 Cobol experience on a similar Honeywell machine. Benefits include contributory pension and life assurance scheme and luncheon vouchers of £420 p.a.

For a job description and application form, please contact:

The Personnel Department
Elf Oil (G.B.) Limited
on (061) 928 6477

(8361)



Xitan is the foremost UK distributor of professional Microcomputer Software to the trade. Due to continuing rapid expansion we now have a vacancy within our support department.

TECHNICAL SUPPORT

You will be responsible for providing technical support and trouble shooting backup to the wide range of software that we distribute for CP/M, CP/M-86, PC-DOS, MS-DOS and other related operating systems.
This position provides an excellent opportunity for expanding your knowledge in the area of the latest developments in the fast moving software industry.
Applicants will preferably be graduates in computer science or related subjects; however, relevant experience and the ability to work logically on a customer orientated outlook is equally important.
As part of the Comart Group of Companies the above vacancy has a range of benefits including pensions scheme, company share scheme, sickness benefit and 20 days' holiday p.a.
Application form from:

XITAN LIMITED
Xitan House
27 Salisbury Road, Totton
Southampton SO4 3HX
Telephone: (0703) 871211

XITAN

(8366)

SENIOR PROGRAMMER (MUMPS) from £700 p.w.

HOLLAND

Requirements for this position include good MUMPS experience, PDP/11 and VAX. Technical background. Preferably with experience in the oil industry.

INTERGRAPH SPECIALIST from £700 p.w.

HOLLAND

Solid Intergraph experience on system level is required for this vacancy. Experience with IGDS/8.

SCIENTIFIC/TECHNICAL PROGRAMMER

HOLLAND

A permanent position with excellent career prospects in our technical services division. Knowledge of FORTRAN, IBM, DEC and graphics preferred.

PROGRAMMER from £650 p.w.

HOLLAND

A technical background with oil industry experience is preferred for the above position. Also knowledge of IBM, TSO, SPF, FORTRAN and MARK IV.

Please write giving full career details to: Ms. J. Donaldson, Jaggers Computer Consultancy BV, Nassaulaan 15, 2541 JT The Hague, The Netherlands.

(8398)

COMPUVAC

COBOL PROGRAMMERS — **TO £12,000**

We currently have a large number of openings for COBOL Programmers. Ideally you will have worked on IBM mainframes for at least one year and have some knowledge of software, especially CICS and DL1 or IMS. Vacancies exist in and around London. REF: LD/CW

PL1 PROGRAMMERS — **TO £11,500**

A number of clients based in London and the Home Counties are looking for PL1 Programmers at all levels. Any experience of CICS or IMS would be advantageous but not mandatory and most opportunities offer a good career path into Senior Programmer and Analysis positions. REF: LD/CW

ANALYST PROGRAMMERS — **TO £14,000**

Our client based to the South West of London is urgently seeking Analyst Programmers with a good knowledge of COBOL or PL1 on MVS or DOS systems. You should also have experience of on-line systems working from feasibility through to implementation. REF: LD/CW

SYSTEMS PROGRAMMERS — **TO £19,000**

Based in the London area, our clients are looking for experienced people with a sound knowledge of DOS, VM or MVS systems. Applicants must have experience of some of the following: CICS, ACF, VTAM, DL1, IMS, TSO, SNA. A number of the positions include generous benefits packages. REF: RC/CW

SYSTEMS ANALYSTS — **TO £15,000**

Candidates should have up to five years' experience in Analysis and would have seen a major project from feasibility through to implementation. You should possess good communications and supervisory skills and preferably have worked on the database side. Positions are based in Home Counties and London. REF: RC/CW

IBM CONSULTANCIES — **TO £20,000**

A large software house based in Central London are looking to recruit senior data processing personnel in a number of areas with sound IBM mainframe experience on OS or DOS/VS systems. A previous programming background in ASSEMBLER would be desirable as is proven supervisory or management experience. REF: RC/CW

SYSTEMS DESIGNERS — **TO £13,000**

A number of clients in Greater London are looking for Systems Designers with at least two years' experience in Analysis and Design. Applicants should have good user communication skills and have project control and implementation experience. A programming background is preferred, especially at senior levels as the positions are more technical than business orientated. REF: RC/CW

RPG3 PROGRAMMERS — **TO £14,000**

Vacancies exist in all areas including banks for experienced System 38 professionals. Job duties range from rewrites for conversions to training in financial analysis. Minimum of one year's RPG3 experience. REF: MB/CW

GSD CONSULTANCIES — **TO £20,000**

Three progressive, expanding software houses all based in the Greater London area have requirements for confident RPG professionals with good oral and written communication skills for consultancy roles. Previous software house experience an advantage but not essential. REF: MB/CW

UNIVAC 1100 — **TO £14,500**

Demand for 1100 professionals is currently very high with positions all over the Greater London area but particularly in the Northern Home counties. Any T.P. or Database experience would be advantageous. REF: CC/RW

IDMS/TPMS PROFESSIONALS — **TO £15,000**

A minimum of one year's experience of IDMS or TPMS coupled with a sound ICL COBOL background can secure you a career move well worth taking. Standards are high but so are the rewards. If you feel you can fit the bill, call now! REF: CC/CW

HONEYWELL COBOL — **TO £15,000**

Level 64 or 66 experience is required by our client for roles as Programmer or Analyst/Programmer on development projects. Experience of at least one of the following preferred: DMIV, IDS, TDS. REF: CC/CW

CPS RECRUITMENT CONSULTANTS

TELEPHONE
253 5042
10 LINES (24 HOURS)
OR **250 0456**

COMPUVAC HOUSE
121-125 City Road, London, E.C.1
(NEXT TO OLD STREET TUBE EXIT 1) OR SEND C.V. TO
COMPUVAC FREEPOST EC1B 1EN

(8418)

MAXIMISE YOUR POTENTIAL

Our Client, a major driving force in the semi-conductor industry, has spearheaded many of the technical innovations over the past decade.

The European Division of this major blue-chip Organisation, is making full use of systems innovation to enhance and benefit the efficiency of their operations. With plants throughout Western Europe, the systems are developed and supported by a Central Support Group based in the UK. Due to major developments in hand and the need to further enhance this facility, they are able to offer two unique career opportunities for the following:

Programmer/Analyst
£8,500 – £11,500 + Benefits

You will be developing and supporting systems throughout the European Division and will need to travel as required spending short periods off site if necessary.

Your skills will have come from IBM experience probably 370 based, including COBOL/DL1. With an integrated systems policy the use of communications and interface facilities incorporating TSO/SPF, is standard.

The role will demand self discipline in organising your own schedules and a business approach in analysing requirements and dealing with end users at all levels and in a variety of situations. Without doubt a challenging role, in an Organisation where ability, not length of service, is the criteria for career progression.

Programmer
£7,000 – £9,000 + Benefits

Based in our Bedfordshire location, you will be working in an excellent environment that fully utilises the latest systems techniques. Supporting our development teams, you will be providing programming support to a wide variety of systems across a diverse applications spectrum.

The ability to work as part of a team and also independently calls for a versatile character and mature personality. These characteristics coupled with good IBM COBOL experience are the attributes which they seek in the successful Candidate and further career prospects would depend only on your ability.

The current environment utilises IBM mainframe facilities, with a range of minis and micros throughout the installation. Providing services to a group utilising over 22,000 terminals, 8,000 stand alone processors and 470+ disk drives creates a dynamic environment offering tremendous challenge and interest. These career openings within this highly regarded Organisation represent the opportunity to see yourself develop to the leading edge of the industry. Additional benefits include profit sharing, private health plan and full relocation where necessary.

Candidates should contact **Brian Harris on 021 236 3781** (24 hour answering service) or send a current Résumé to the **Birmingham** address shown below at the earliest opportunity.

(8385)

Technical, Sales & Management Appointments

ESPRIT
Specialist Computer Recruitment Ltd

SOUTH James House, 46 James Street, London W1M 5HS 01-935 0871/486 0461
MIDLANDS & INTERNATIONAL 35-37 Great Charles Street, Queensway, Birmingham B3 3JY 021-236 3781
NORTH International House, 84 Deansgate, Manchester M3 3EE 061-833 0427
BELGIUM Avenue Louise 327, Boite 4, 1050 Bruxelles 010 322-640 715V71
HOLLAND Willemsparkweg 92, 1071 H.M. Amsterdam 010 3120-760947

PROJECT MANAGER
£15,000

Babygro Ltd., a leading manufacturer of babies' and children's clothing, employing 500 people at their Kirkcaldy and Cowdenbeath factories, wish to appoint a Project Manager for an initial 2 year contract.

The person appointed will lead the implementation of the company's Interactive Manufacturing Control System utilising NCR 9040 system hardware.

Reporting directly to the Director of Finance, the successful applicant will have the maturity and personal authority to liaise with both senior management and end-users to ensure the satisfactory completion of the project.

This key role demands a high degree of enthusiasm to get the job done. Previous experience in a manufacturing environment is essential and a knowledge of COBOL and previous NCR equipment exposure is desirable.

A salary of £15,000 p.a., free life insurance and assistance with relocation to this attractive part of Fife, within easy reach of Edinburgh, will be the reward.

If you feel that you have the experience and ability for this demanding opportunity, please call Jenny Combe on 031 226 5381 for a confidential discussion; alternatively forward a detailed C.V. to her at:-

ATA Selection & Management Services Ltd.
Anglia House
26/28 Frederick Street
Edinburgh EH2 2JR

(8372)

ata

City

OPERATIONS

Deputy Controller — *to £10k*

An ideal opportunity for a conscientious Senior Operator/Shift Leader to move into a Days Only Supervisory position.

Our client is a progressive organisation with markets worldwide and an annual turnover exceeding £95m. The London office is the focal point of their operation.

The Data Processing department has a good reputation within the company and is recognised as a vital part of their business.

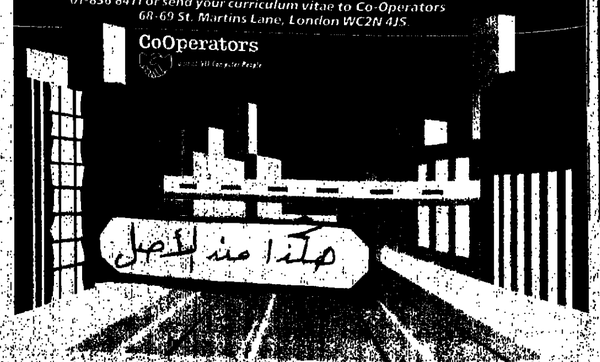
The configuration is a Honeywell DPS4 (.75MB) running under GCOS4; one PERKIN ELMER 3220 (1MB) and one PERKIN ELMER 3230 (2MB).

Whereas knowledge of these disciplines would be preferable, comprehensive training will be provided for the right applicant with a good supervisory background.

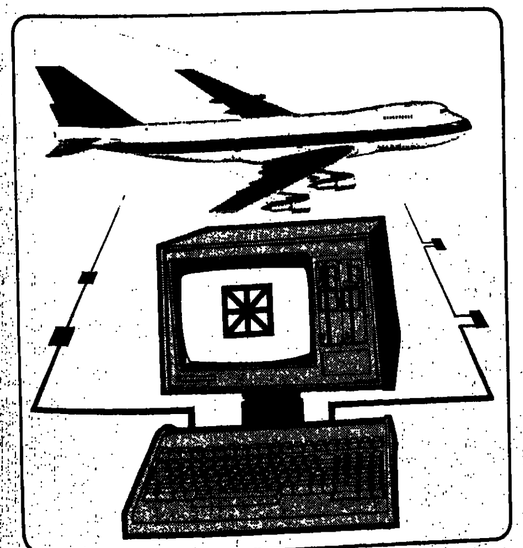
You will be responsible for the effective and efficient operation of all computer systems both in the computer room and in the user departments. The appointment involves an element of hands-on operating and in addition you should possess good administrative skills and the ability to communicate at all levels. Ideally you will have 1-2 years experience in a similar position within a small D.P. environment.

To learn more about this challenging role contact Steve Parsons on 01-836 8411 or send your curriculum vitae to Co-Operators 68-69 St. Martins Lane, London WC2N 4JS.

CoOperators



Christian Rovsing A/S



Communications Software Designers

for
Advanced Data Networks Development
in the **U.K., Denmark or the Netherlands**

Christian Rovsing A/S is a large European manufacturer of state-of-the-art datacommunications networks whose products have excited considerable interest in Europe and North America, particularly amongst international airlines.

The company is now able to offer software engineers large turnkey development projects in the fields of

- ★ Network Protocols (including latest ISO standards)
- ★ Terminals and Hosts Protocols
- ★ Electronic Mail
- ★ High level Protocols (file to file transfer)
- ★ Specialized airline protocols
- ★ Network Management

Candidates should be software engineers with project experience in software development in datacommunications or real time environment or have programming skills in **PASCAL**
C
ASSEMBLY languages

For further information please contact Brian Harris at O.C.C. on 0270 627206 daytime or 0270 629454 evenings or weekends. Alternatively contact Steve Cook of Christian Rovsing Systems on 0734 869010 or write to him at Gloucester House, 478a Basingstoke Road, Reading.

OCC

Specialists since 1971 in UK and International computer & technical appointments

OCC Computer Personnel
5 Hospital Street
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SENIOR PROGRAMMERS IBM CICS COBOL INTERNATIONAL BANK

This leading European Bank, well established in the heart of the City, is undergoing substantial expansion and requires two additional senior programmers. These candidates must have a certain spark, enthusiasm and imagination, and in return for these qualities will be offered a remarkable opportunity. The Bank has IBM 4341s with CICS and advanced online database systems and needs people to:

- **Design CICS COBOL Systems**
- **Work in the centre of CICS expertise**
- **Provide guidance to other programmers**
- **Demonstrate analysis potential for the future**

This organisation employs teams of dedicated individuals, who use their initiative to participate in developing new systems and are given the freedom to use their creativity.

THE SALARIES ARE COMPLETELY OPEN: There is no fixed scale for these positions.

You will negotiate your salary to reflect the experience and future contribution you can make. You will also be entitled to the very substantial benefits associated with a major banking institution.

For details phone Jill McGill on 01-734 9723 or 263 2261 (evenings and weekends)

(8414)

CTR Computer Technology Recruitment Ltd.
Triumph House, 189 Regent Street, London W1R 7WD.

your appointments register

Programmers

NCR/IBM/COBOL	to £15K	
Insurance Banking	London · H Counties · N. Eng.	
COBOL/PL1/OS/CICS/IMS	to £13K	
Commercial	H. Counties Midlands · Manchester	
PROGRAMMERS	to £12K	
DATAPOINT	Berks	
ICL/COBOL	to £12K	
Two years' commercial experience	Notts	
DEVELOPMENT PROGRAMMERS	to £14K	
CP/M + DEC	Herts	
RPG 2/3	to £14K	
Minimum one and a half years' experience	Northants/Leicester/London/N.E.	
SYSTEMS PROGRAMMERS MVS CICS	to £17K	
Systems experience	Middx	
BASIC/ASSEMBLER	to £15K	
Mini/Micro Computers	London	
MINIs	to £12K	
Commercial Applications	Norwich/Croydon	
APPLICATIONS PROGS	to £14K	
COBOL "C" and Unix	London	

Analyst/Progs

DEC	to £15K	
Industrial Applications	Bucks	
IBM 34/38/4341	to £15K	
London/Home Counties/Leicestor		
HP3000/280	to £14K	
Assembler Micro Processor Based Applications	Middx.	
MS/DOS	to £16K	
"C" Datacomms experience	Middx.	

Hardware/Support

TECH. SUPPORT MANAGER	to £18½K + CAR	
IBM DOS/VSE CICS IDMS	Kent	
SERVICE ENGINEERS	to £12K	
DEC exp.	London	
SOFTWARE SUPPORT ENGINEER	to £14K	
FORTRAN essential	Middlesex	
OPERATION SYSTEM SUPPORT	to £15K	
Mainframe/Assembler experience	Bucks	
DEVELOPMENT ENGINEER	to £14K	
Video Terminal Manufacture	Middx.	
TECHNICAL SUPPORT	to £12K + Car	
IBM Installations	Nationwide	

Systems Analysts

SPERRY 1100/FORTRAN	to £14K	
DATABASE Techniques	Herts	
CAD/CAM	to £15K	
Real time · Modelling	Man/Essex/South Yks	
IBM/BURROUGHS	to £15K	
Commercial Accountancy	London/Surrey/Manchester	
BASIC plus/PDP	to £11K	
	Tunbridge Wells	
IBM/ICL	to £14K	
Commercial Applications	London/Midlands	
ICL 2900	to £11K	
COBOL	Dorset	

Software Engineers

CORAL/PASCAL/MASCOT/C	to £15K	
Communications	Glos/H. Counties/Midlands/Blackburn	
REALTIME	to £15K	
Experience in embedded Micro-Processor Systems and M.O.S. Devices	Berks.	
MILITARY SYSTEMS/RADAR	to £17K	
Coral · Mascot	Hants/Surrey/Essex/S. West	
PDP/VAX/INTEL	to £16K	
High Level Assemblers	in Derby/Surrey/ London/Kent	
FORTRAN 77/ASSEMBLER	to £16K	
Coral/Mascot/APT/Communications/ Protocols	Ayon	
HP3000/INTEL	to £12K	
CAD/CAM/ATE	Home Counties	
Z80/ASSEMBLER	to £11K	
Bi-lingual Terminals/Emulation	Surrey	

Snr Appointments

INTERNAL SALES ENGINEER	to £12K	
Micro Development Data products, Logic and Data-com Analysers	Middx	
SALES EXECUTIVES	to £30K	
Mainframe	Nationwide	
CONSULTANTS	to £18K	
CAD/CAM	NATIONWIDE	
SYSTEMS MANAGER	to £15K	
Networking Systems and Communications MODEM Datapost ARC	Manchester	
SALES EXECUTIVES	to £20K	
Personnel computers/IBM Systems	Surrey	
MICROCOMPUTERS	to £20K	
Local Area Nets through Distributors and OEM's	South	
SOFTWARE SECTION MANAGER	to £16K	
Pascal/C/Microprocessor	Essex/Middlesex	

You can be sure of hearing about many opportunities like these, U.K. and abroad, when you make Sloangate your first choice. Take the next step in your career with us!

telephone 01 549 9236

Sloangate The Appointments Register

SLOANGATE LIMITED
Dominic House
171-177 London Road
Kingston-Upon-Thames
Surrey KT2 6NA
Telex 818417 SLOAN G

OVERSEAS CONTRACTS

U.S.A.

Systems Analyst	IBM IDMS-DC	New Jersey	Urgent
Analyst/Programmers	IBM IDMS-DC	New Jersey	Urgent
Systems Programmers	Univac 1100 EXEC/DMS Internals	New York	Urgent
Analyst/Programmers	IBM IMS DB/DC COBOL	New York State	Urgent
Database Administrator	IBM IMS DB/DC	Boston	Urgent
Programmer/Analyst	Univac V77 COBOL/ Assembler	New York	Urgent
Database Administrator	Univac 1100 DMS 1100	New York	May
Programmer/Analysts	UNIX/'C'	All Areas	Urgent

EUROPE

Programmer/Analyst	IBM Series 1 EDL COBOL	Brussels	A.S.A.P.
Programmer/Analyst	VAX 11/780 VMS, RTL2	Holland	April
Systems Programmers	DOS/VSE and MVS	Amsterdam	A.S.A.P.
Systems Programmer	COPICS Internalist	Holland	A.S.A.P.
Programmers	IBM, PL1, IMS DB/DC	Brussels	A.S.A.P.
Programmer/Analyst	IBM MK4 IMS DB/DC	Rotterdam	A.S.A.P.
IBM Systems Progs.	All Operating Systems	Frankfurt/Munich	A.S.A.P.

Permanent

Systems Analyst	IBM System 38 Banking Application	Frankfurt Salary to £20K	Urgent

London 01-734 0152
Knight Programming Support Ltd FREEPOST 38, London W1E 6QZ
Manchester 061-833 9341
Knight Programming Support FREEPOST, Manchester M3 8BL

London Manchester Birmingham France Holland U.S.A.

Knight Programming Support Limited — INTERNATIONAL COMPUTER CONSULTANTS

(8404)

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

COMPUTER SERVICES CONTROLLER – Direct Mail

One of the country's leading Direct Mail companies requires a Computer Services Controller with proven ability.

Their current success and future growth is dependent on bureau based computer systems for the manipulation and delivery of data that must meet the exact needs of clients.

To manage these vital functions, from their central London offices, requires an enthusiastic professional, with strong organisational ability and a background that includes:

- ★ Considerable knowledge of the use of computers in direct mail
- ★ Familiarity with de-duplicating techniques and printing methods
- ★ Provision of systems advice to clients
- ★ Control of computer services via terminals
- ★ Job scheduling

A generous salary will be paid, commensurate with experience and the importance attached to the position. Excellent company benefits include: a generous travel allowance, participation in the bonus scheme, pension and free medical assurance.

Please contact Tim Pearce or Ivor Brookstone on 01-637 9611 or send your c.v. to the address below.

Please advise which companies you do not wish to have your details forwarded to.

(8383)

Suite 201/6 Albany House
324 Regent Street London W1 **MANAGEMENT & EXECUTIVE SELECTION**

LANGTON

Langton Electronic Publishing Systems Limited is an established but fast expanding systems house specialising in information management.

As a stable and profitable organisation they cover areas such as text and graphics, demand printing, viewdata, on-line retrieval systems, optical and video discs and computer assisted retrieval and delivery systems.

TECHNICAL SUPPORT ANALYST
UP TO £14,000

As part of their expansion plan they now require a technical support analyst.

You will be involved in the installation and support of electronic publishing software products, including trouble-shooting on customer sites.

The position will require some travelling to Europe and potentially North America.

Ideally your background will include eighteen months plus experience in a development or support environment with exposure to IBM VM.

EXCELLENT BENEFITS PACKAGE

* Bonus Scheme * Interest Free Season Ticket Loan
* Pension Scheme * Flexitime

For an informal discussion regarding this opportunity please telephone Miles Richards on 01-938 1804 (24 hours) or 01-947 2385 (7pm – 9pm).

IPP Information Processing People
Specialist Recruitment Consultants
20 Kensington Church Street, London W8 4EP
Telephone 01-938 1804 Telex 22861

ENGINEERING OPPORTUNITIES

Northants

Our Client, market leaders in the provision of turnkey systems to interactive graphic and CAD applications; have seen a marked growth in their Client base and are now able to offer two unique career opportunities.

As sole UK distributors of leading interactive systems used across a diverse Client base in industry, commerce and public utility Organisations, the engineering facility is a vital factor in their success. Utilising the latest systems innovations which include VAX, 11/23, H.P. and M6800 technology, and with a planned development policy coupled to continuous evaluation of market and product availability, they fully intend to sustain their established reputation for technical excellence.

To support this, they now seek to appoint two key people into critical positions, in order to further improve the provision of a complete and efficient engineering facility servicing installations involving critical production areas.

Service Manager
c £15,000 + incentives **2 Litre Car**

Your task will be to further develop and implement a Service Organisation on a system basis, to support users where down time is critical.

Able to demonstrate a solid technical career encompassing both hardware and software experience, you will lead from the front a competent engineering staff.

Experience in **graphic/CAD** facilities would be advantageous, but more critical is your ability to implement effective Management controls and supply technical and motivational leadership to your staff.

Providing support services from centre, phone support will play a major part, though you should be prepared to take on site visits personally if required.

Senior Service Engineer
c £13,000 **Plus Car**

Providing Clients with a high level of service efficiency, demands technical competence and professional qualities that will be rewarded by excellent benefits and a highly rewarding career.

Working at both **total system** and **component level** demands experience on current engineering technology encompassing CPU, disk, tape, printer and plotter exposure.

With a diverse application and Client base, the inherent variety and challenge is unique. Coupled with product development, you are assured of staying ahead in technological exposure.

In such an environment, personal attributes are weighed as critically as technical competence, giving indication of the high standards maintained by our Client.

To apply, candidates should possess a minimum education standard of HND (preferably a Degree) and be able to demonstrate a career to date that proves technical competence and the ability to assimilate new skills. By contributing to the growth of the Company, you can be assured of personal benefit and excellent career opportunities. Full induction and product training, together with generous incentives and benefits, including pension, private health plan and full expenses, indicate the environment. Full relocation assistance is available where necessary.

Candidates should contact the Advising Consultant, **Brian Harris**, on **021 236 3781** (24 hour answering service) or send current résumés to the **Birmingham** address shown below as soon as possible.

(8386)

Technical Sales & Management Appointments

Specialist Computer Recruitment Ltd

SOUTH: James House, 46 James Street, London W1M 5HS, 01-935 0071/486 0461
MIDLANDS & INTERNATIONAL: 35-37 Great Charles Street, Queensway, Birmingham B3 3JY, 021-236 3781
NORTH: International House, 84 Deansgate, Manchester M3 3EE, 061-833 9427
BELGIUM: Avenue Louise 327, Boite 4, 1050 Bruxelles, 010 322 640 7151/71
HOLLAND: Wittenspark weg 92, 1071 H.M. Amsterdam, 010 3120-760947

DALROTH

SAUDI ARABIA
TAX FREE £19,000-£32,000

IBM · DEC · WANG

Commercial or T.P. Network Expertise

The skills currently required to maintain the thrust of new development now urgently include personnel from areas of medium size mainframes and small computing systems backgrounds.

You will be working within a computing environment internationally recognised for the development of their state-of-the-art equipment and facilities; socially you will discover that located in the Arabian Gulf leisure and sports activities are also almost without limit.

The standard consultant's package includes free flights, accommodation and Medicare. This together with the generous tax-free salaries available, can provide an opportunity beneficial to candidates with the following backgrounds:

1. SYSTEMS ANALYST/TRAINER
– specific responsibilities will include analysis and design together with the training of applications oriented personnel working in DEC/VAX based systems.

2. SYSTEMS PROGRAMMER
– main responsibilities will include DEC/VAX hardware installation and software development for network systems.

3. SYSTEMS ENGINEER
– installation and software support for WANG systems including SNA interface to IBM hardware.

4. PROGRAMMER/ANALYSTS
– to maintain and/or develop medium size mainframe business applications for conversion to run on a P.C. network for which PL/1, MVS, JCL, extended SPF and Mark IV is required. Knowledge of IBM P.C. and Micro networking/multi user operating systems with mini/micro networking hardware/software preferred.

5. ANALYSTS/CONSULTANTS
– Information Technology. To provide professional technical consulting in the application of information technology within user organisations. Knowledge of IBM, WANG or DEC hardware/software with recent experience in project management is required.

6. SYSTEMS ANALYSTS
– Office Systems. Experienced in office systems fields with knowledge of applications for IBM/DEC/WANG small computers, more recently in the design, analysis and control of office systems with emphasis on work processing/data processing or micro systems.

7. SENIOR ANALYSTS
– Risk/Benefits Analysis. With long range planning and risk/benefit analysis experience required to liaise at senior level for applications planning. Knowledge of mini/micro business applications an advantage.

8. ANALYST PROGRAMMERS
– A PL1 programming background is essential, ideally including IMS, TSO/SPF, ADF on large IBM mainframe hardware.

The start dates are flexible, however, the client requires interviews scheduled over the next few weeks for which you should contact Caroline Tee on day, 01-493 2947 or evenings/weekends 01-455 0236 without delay for further application details quoting ref. 5057.

DALROTH & PARTNERS LTD. 4 HALF MOON STREET, LONDON W1
Tel: 01-493 2947

NETWORK CONTROLLERS

LONDON SW17
£6,712-£11,873

South West Thames Regional Health Authority have a requirement for experienced Network Controllers to join a rapidly expanding group dealing with the installation, maintenance and administration of a fast growing communications network. Candidates should have a minimum of six months' experience working within a network control environment and be conversant with equipment, principles and conventions relating to such an environment. He/she will also have experience of liaising with British Telecom and suppliers and users of telecommunications and terminal equipment. The positions will initially be days only but extended hours working may be required in the future.

Appointments will be made at a grade and salary level appropriate to the applicant's experience and qualifications.

For further details contact:

Keith Fox
Communications Network Manager
S.W.T.R.H.A.
Regional Computer Centre
Springfield Hospital
Glenburnie Road
Tooting, London SW17 7DJ. 01-672 9988

(7988)

ENGINEER YOUR CAREER

TRAIN IN THE U.S.A. . . . AND TAKE YOUR FAMILY WITH YOU
Earn between £10K and £14K Basic + O.T. + Standby
Drive a 2-litre GL company car – private petrol paid

Field Service Engineers with a good knowledge of mini/mainframes are offered the opportunity to work for this world-leading manufacturer of non-stop processing minicomputer equipment.

INTERESTED IN CAD/CAM?
Basic Salaries to £11K + 2-litre car + all benefits

Substantial growth (60% p.a.) has now created a number of vacancies throughout the UK. Our client can proudly boast that they are the world leaders in the manufacture of CAD/CAM mini computer systems.

JUST STARTING OUT?
Woking, Essex, Scotland, Hemel Hempstead

Would you like the opportunity to get your foot in the door of the computer industry? Our Client, a major micro manufacturer can give you the key.

Phone JACKIE WOOD on 01-543 4844 days or 0403-58689 Eves/weekends

ALLTRONICS PEOPLE (AGY)

(7987)

Control/Application Engineer
Bingham – Notts.

A current vacancy exists for an industrial control engineer, with a thorough knowledge of programmable controllers or microprocessors.

Ideally qualified to degree level, although ONC/HNC/HND qualifications with the relevant experience will be considered, the ability to program in ladder network is an essential requirement. Additional knowledge of a computer language and/or in-depth experience of Allen Bradley, Modicon, IPC or GEC programmable controllers would be a distinct advantage.

We have a major involvement in the application of computers, graphic equipment, programmable controllers and communication networks to most industrial process control systems. In addition, we have the expertise to handle all facets of control, from conception through to customer acceptance.

Candidates must be dedicated and capable of working independently both at base in the highly attractive market town of Bingham and on occasional overseas assignments.

Salary is negotiable with benefits appropriate to a company of our standing.

If you feel that you can meet the requirements of this position, we look forward to hearing from you. Send a c.v. to Peter R. Clark, Haden Automation Systems Limited, P.O. Box 14, 7-12 Tavistock Square, London WC1H 9IZ.

Haden HADEN AUTOMATION SYSTEMS LIMITED

(8008)

1-2 YEARS' PROGRAMMING?
HOW ABOUT VAX?
(and others)

Come and talk to us about developing your skills by helping in software applications package development for on-line distribution systems.

Salary will not present a problem for the right applicants and a profit sharing scheme is in operation.

Send a brief CV or, preferably, phone Tony Fowler or David Elsby at:

APT

Kemp House
152/160 City Road
London EC1
01-251 6681

(8421)

UNIVERSITY OF READING COMPUTER CENTRE

SYSTEMS PROGRAMMER

A Systems Programmer is required to join the group developing and maintaining systems software within the Computing Service. The Centre operates an Amdahl V/7A, running VM/CMS, and UTS and 3 Norsk Data machines, plus an extensive X25 campus packet-switched network. The Centre is also connected to the National Centres at London and Manchester. The Programmer's main duties will lie in the VM/CMS group, and familiarity with this or another IBM system would be an advantage. Applicants should possess a degree and relevant postgraduate experience. The post is of permanent one on either Grade IA (£7,180-£11,616 p.a.) or Grade II (£5,180-£10,155 p.a.), according to experience. The post carries USS superannuation. Apply quoting Ref. S.1/A for application form and further details to Personnel Office, University of Reading, Whiteknights, Reading RG6 2AH. Closing date 30.3.84.

(8228)

Systems Analyst
£9,060-£10,539 p.a.

Our installation is based on two ICL 2966 computers with an extensive County wide network of ME29s, DRS micros and over 180 terminals. Both DME and VME operating systems are currently supported. We are committed to an extensive development plan centred on VME and one of the new projects we are undertaking is a Personnel system. A systems analyst is required to take a key role in the development of this project.

To satisfy exacting requirements you must have at least five years' relevant experience with an in-depth knowledge of analysis and design having seen at least one large project through to implementation. Practical knowledge of VME, IDMS and DDS is essential.

For further information contact Ian Pearne on Truro 71708 or obtain an application form from The County Treasurer, County Hall, Truro, Cornwall TR1 3BD.

Closing date: April 2, 1984.

(8216)

Cornwall

EPSON

OPEN DAY
MARCH 20th

READING

EPSON *cordially invite you to after-work refreshments at the* **Ramada Hotel,** *Oxford Road, Reading, Berkshire, on Tuesday March 20th. Not only refreshments but the chance to discuss what could be the most important career development opportunity for you so far.*

EPSON have the largest share of the world market for Mini-printers, Dot matrix printers, and LCD's. We are also manufacturers of the HX20, the top selling business portable computer in the UK and are rapidly expanding our penetration of the desk top micro-computer market.

Since 1979, the annual turnover of the UK operation has risen to over £30M including a growth rate of well over 250% in the last year. This has been achieved by the relentless pursuit of excellence at every level from research and development through production to marketing.

We are now planning to launch many new and innovative products in the next 12 months and offer exceptional ground floor opportunities for specialist personnel at our UK headquarters in Wembley.

- ★ *Software Development Specialists – with UNIX, CP/M or MS/DOS, PASCAL, C, Z80 and 8086 experience.*
- ★ *Operations System controller (VAX 750) with experience of a UNIX and LAN development environment.*
- ★ *Technical Support Specialists – Applications – Software with Basic and CP/M.*
- ★ *Technical Support Specialists – Hardware – with micro and peripherals experience.*
- ★ *Senior Service Engineers – with inhouse and field service experience.*
- ★ *Technical Trainer – Hardware/Software with qualified training background.*
- ★ *Technical Product Managers for Printer and OEM products.*
- ★ *Technical Author.*
- ★ *Systems 34/36 Manager with ops. analyst/programming experience.*

We look forward to seeing you on the 20th. If you have any queries please call our advising consultants, Craig Millar or Karen Whelan on 01-637 9611, or send your C.V. to the address below.

4pm until 9pm

MANAGEMENT & EXECUTIVE SELECTION

Suite 201-208 Albany House, 324 Regent Street, London W1R 5AA

PUBLIC SECTOR APPOINTMENTS

UNIVERSITY OF CAMBRIDGE
DEPARTMENT OF ENGINEERING

COMPUTING

The Department is expanding its computing facilities and integrated computer-based teaching, a project made possible by a generous grant from IBM. Applications for the following posts are invited from candidates with a good honours degree in Engineering, Mathematics, Physical Sciences or Computer Science.

MANAGER OF COMPUTING

The principal responsibility of the holder will be to supervise the development and running of the department's major computing systems and to provide a computing service for teaching and research. The manager will be closely involved in the development of the department's new computer-based teaching project.

A minimum of 10 years' experience in practical computing and some managerial experience is required. Experience of interactive computing and an interest in the use of computers for teaching would be highly desirable.

The post is that of Computer Officer Grade I or II, depending on age and experience, with salaries in the range £10,710 to £16,065 for CO I and £9,426 to £12,546 for CO II. The post is a permanent one with initial appointment for 5 years.

RESEARCH ASSISTANT

Applications are invited for 4 posts of Research Assistant. The principal duties will involve the development of the computer-based teaching system together with its appropriate range of applications packages and utilities.

A good honours degree, preferably with some postgraduate experience, and some experience of systems programming is essential; an interest in interactive computing and its use in teaching is highly desirable.

The salary is in the range £8,315 to £9,425 depending on age and experience. The posts are tenable for 3 years with the possibility of reappointment for a further 2 years.

Further particulars and application forms may be obtained from the Secretary of the Faculty Board, Department of Engineering, University of Cambridge, Cambridge CB2 1PZ, to whom applications must be sent by April 13.

(8422)

City of Coventry
TILE HILL COLLEGE OF FURTHER EDUCATION
DEPARTMENT OF BUSINESS AND PROFESSIONAL STUDIES

VISUAL SELLING AND MERCHANDISING

A practical short course

The impact of effective window display and modern store layout can dramatically improve the turnover of retail business.

If you are a retailer or have plans to open a retail business and are also keen to improve your knowledge and skills in these two vital areas contact:

John Cook/Paula Bowskill, telephone Coventry 461444 ext 234 or Beryl Kimberley ext 242.

(8337)

CHORLEY BOROUGH COUNCIL
(AN EQUAL OPPORTUNITY EMPLOYER)
TREASURER'S DEPARTMENT

COMPUTER PROGRAMMER/ ANALYST

Scale 5 £7,191-£7,896

Applications are invited for the above post from persons having some experience as a programmer preferably, but not necessarily, in local Government.

The Council is currently updating its computer equipment and has installed an ICL ME29/37 with a variety of terminals and an RJE link to Lancashire County Council. The RJE link will continue for current applications but future development, particularly non-financial applications, will be carried out locally.

The successful applicant will be responsible for some systems analysis plus writing, testing and maintaining programs, involving close liaison, in conjunction with the Data Processing Officer, with Senior Officers of other Departments. Programs will be developed using RANGE COBOL, and TMS-IP. It would, therefore, be an advantage if applicants had a knowledge of COBOL on ICL hardware and software, preferably ME29.

Application forms and further details are available from the Chief Executive Officer, Town Hall, Chorley, Lancashire PR7 1DP (Tel: Chorley 65611 ext 226). Completed forms should be returned by March 22nd, 1984.

Canvassing by any member of the Council will disqualify

(8355)

BOROUGH OF DARLINGTON
FINANCE DEPARTMENT — COMPUTER SECTION

SENIOR ANALYST/ PROGRAMMER

Salary Grade SO1/POA £9,060-£11,052 per annum

A Senior Systems Analyst/Programmer is required to assist in maintaining and improving existing systems, in addition to developing a wide range of new projects.

The Council operates a Honeywell Level 64 D.P.S.2 with distributed terminals. The successful applicant must have sufficient systems analysis/design experience to lead a small team in implementing a project from feasibility study to operational running. Familiarity with "on-line" concepts will be expected and experience of COBOL would be an advantage, as would a local Government background.

Commencing salary within the above salary grade will be dependent on age, experience and qualifications.

Assistance towards removal and relocation expenses will be available where appropriate.

A closed shop policy is in operation and all new employees are required as a condition of employment, to become a member of an appropriate trade union.

Application forms and further details are available from the Head of Personnel and Management Services, Town Hall, Darlington, Co Durham.
Telephone: (0325) 460661, extension 316.
Closing date: Monday, April 2, 1984.

(8430)

Senior Systems Analyst

£12,555-£13,929

Systems Analysts (2)

£11,136-£12,894

The Council has recently approved an increase of 3 systems posts to undertake priority development of a major Housing system and is now seeking applications from suitably qualified computer professionals to join our expanded systems teams involved with Housing and other new developments.

The Senior post requires a minimum of 3 years' proven computer systems experience having successfully completed on target at least one major system combined with the ability to lead and control a system team of from 1-4 staff. The Systems posts require a minimum of 2 years' systems experience having been responsible for successfully completing at least one system to target.

Experience of database software and TP systems will be an advantage. Opportunity is afforded to start right at the beginning of the Housing project which is likely to prove both challenging and exciting.

Software in use includes IDMS, TPMS, DDS and IDH, and an extensive network of nearly 200 dumb and intelligent DRS terminals is connected to the ICL 2972 VME/B system.

Conditions of service include a 35-hour flexitime week: 31 days' annual leave (plus 9 statutory days); and a season ticket scheme. As one of the largest London Boroughs opportunities for career advancement are excellent.

To discuss these positions informally please telephone Phil Collins (Development Manager) on 01-874 6464 ext. 210, or if you prefer, apply for an application form to Director of Finance, Town Hall, London SW18 2PU. Tel: 01-874 6464 ext. 410. All posts close 30th March, 1984.

(8481)

Wandsworth
an equal opportunity employer
All applicants are considered on the basis of their suitability for the job irrespective of disablement, race, sex or marital status

LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY

Neptune Multiprocessor Project

Three RESEARCH ASSISTANTS are required to join the research team working on this successful SERC computer project. Experience in developing systems software on multiprocessor or parallel algorithm design is desirable. The appointments are for two years on a salary in the scale £8,060-£8,975. Further details and application forms are available from Professor D. J. Evans, Department of Computer Studies.

Loughborough *Leicestershire*

(8359)

LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY

PROGRAMMER

A vacancy exists for a PROGRAMMER within the University Library. The work comprises maintenance and development of computer systems on Honeywell (Multics) and Sperry (V77/800) computers. Knowledge of COBOL and experience of online systems would be an advantage. The post will be for a fixed period of three years; the appointment to be made in the lower half of the salary scale £7,190-£11,615. Further details and application forms from Paul Johnson, Establishment Officer, ref. 84/13 LB.

Loughborough *Leicestershire*

(8360)

NORTH WESTERN REGIONAL HEALTH AUTHORITY
Regional Treasurer's Department

REGIONAL COMPUTING SERVICES MANAGER

Salary Scale 27: £12,958-£16,824 per annum

Additional allowances up to £554 per annum may also be payable

This is a key post based at the Regional Computer Centre, Prestwich, Manchester, and the responsibilities include:-

(a) development of integrated policies for the deployment and effective use of computer services throughout the Region, which covers the counties of Greater Manchester and Lancashire;
(b) acting as Secretary to the Regional Computing Committee;
(c) managing approximately 130 computing services staff;
(d) advising on choice of computer equipment.

Candidates should have wide experience in the management of large computer installations.

Application forms and job description from the Regional Personnel Officer, North Western Regional Health Authority, Gateway House, Piccadilly South, Manchester M60 7LP, telephone 061-236 9456 Ext. 426. Please quote reference number 2582A. Closing date 30th March, 1984.

(8347)

ANALYST/PROGRAMMER

Grade S6/SO1 £8,154 to £9,660 p.a.

This is a temporary appointment for one year and applicants should have at least two years' proven experience in specification and development of Cobol programs in ICL hardware. Experience with ICL DRS equipment and Fortran would be advantageous. The successful applicant will work as a member of a group providing computer support to the staff of the highways and transportation department. The work will be on a dual ICL 2690 running George 3 under DME and on ICL DRS equipment. The work will be predominantly the specification and development of management information systems relating to work of technical users within the department.

Commencing salary will be in accordance with qualifications and experience.

Application forms and further details are available from the County Surveyor, Northampton House, Northampton. Telephone 34833, ext. 5308.

Closing date for receipt of applications March 30th, 1984. Please quote reference H434.

Northamptonshire
Highways and Transportation

(8429)

GLC
Working for London

Systems Development in Traffic Control

The Council has recently approved a remote monitoring scheme for improved checking of traffic signals via a central monitoring computer system, using an ETHERNET Local Area Network based on DEC equipment. Opportunities have now arisen for the following computer professionals to make a major contribution to this challenging project:

Senior Systems Specialist

To work with the contractor responsible for the remote monitoring system assisting, verifying, monitoring and reviewing the work on behalf of the Council. Participation in the specification and design of the system and contributing to software development will be important areas of responsibility.

A science or engineering degree plus at least 3 years' experience of real time systems and programming within a VAX VMS or PDP RSX environment is essential together with project management skills and a knowledge of database management systems.

Salary: £14,412-£15,675 inclusive.

Systems Analyst/Programmer

To assist in software specification, design and development. This may entail secondment to work with the contractor responsible for the remote monitoring system.

Applicants should have *either* a degree or equivalent in science or engineering with at least 2 years' real time programming experience within a VAX/VMS or PDP/RSX environment, or at least 5 years' programming experience of traffic control applications software.

Salary: £8,685-£12,042 inclusive.

For an application form, to be returned by 30th March 1984, write to: Transportation & Development Department, Greater London Council, Room 454B, The County Hall, SE1 7PB or telephone 01-633 7791.

These posts are suitable for job sharing.

The GLC welcomes applicants from all sections of the community, irrespective of their sex, ethnic origin, colour, sexual orientation or disability, if they have the necessary attributes to do the job.

(8362)

The GLC is an equal opportunities employer

NORFOLK COUNTY COUNCIL
EDUCATION DEPARTMENT

Tenders are invited for the Maintenance of Micro-Processor Equipment in Norfolk County Council's schools for a period of three years commencing 1st May 1984.

Full details and tender forms may be obtained from the County Education Officer, Purchasing Section, County Hall, Martineau Lane, Norwich NR1 2DH.

Completed forms should be returned to the County Solicitor and Deputy Clerks Department, County Hall, Martineau Lane, Norwich NR1 2DH, not later than 3 p.m. on Tuesday 10th April 1984.

(8366)

INTERNATIONAL BACCALAUREATE OFFICE

The IB Examinations Office seeks to appoint an

ANALYST/PROGRAMMER

The person appointed will take part in the conversion and development of the Office's computerised data processing. This is currently implemented on a DEC 10 but is scheduled for transfer to a Burroughs B1986 in September 1984.
Requirements: Degree or equivalent, COBOL experience, good communication skills, interest in educational administration and development. Burroughs experience an advantage.
Location: Until 1 September, 1984 in London; thereafter at the University of Bath.
Salary: Up to £9074 according to qualifications and experience.
Further details and application form available from IBO, 2 Tavit on Street, London WC1H 0BT (telephone: 01-388 2553/0096).
Closing date for applications: Wednesday 28th March, 1984

(8446)

UNIVERSITY OF NOTTINGHAM
Microprocessor Laboratory

HARDWARE EXPERT

Applications are invited for an appointment in the University Microprocessor Laboratory. The post concerns the provision of a consultancy service on microprocessors throughout the University and maintaining the teaching and advisory service given by the Laboratory.

For this post, candidates should have a good degree in Electrical and Electronic Engineering, or an equivalent qualification, and experience in the field of digital electronics and preferably in microprocessor or computer hardware. Experience in microprocessor software would also be an advantage. The person appointed will work under the supervision of the Head of Department of Electrical and Electronic Engineering, but the post will be on the staff complement of the Computing Centre of the University.

The starting salary for the post will be within the range £7,190 to £11,615 per annum and it will be dependent on age, qualifications and experience.

Application forms and further particulars can be obtained from the Staff Appointments Office, University of Nottingham, University Park, Nottingham NG7 2RD. Telephone 50851, ext. 2046. Applications should be submitted by 6th April 1984. Please quote reference no. 595.

(8363)

University of Birmingham
Centre for Computing and Computer Science

CHAIR OF COMPUTER SCIENCE

Applications are invited for a new Chair of Computer Science which will become available from 1st October, 1984. The appointment is intended to strengthen the research base of the Centre. Preference may be given to candidates with an established research record in one or more of the areas of Software Engineering, Man Machine Interaction, Intelligent Knowledge Based Systems and Communications. Academic or appropriate industrial experience will be considered.

Salary in the professorial range, with superannuation.

Further particulars available from the Vice-Chancellor, University of Birmingham, P.O. Box 363, Birmingham B15 2TT, to whom applications (15 copies: 1 from overseas applicants) should be sent by 27th April, 1984.

(8313)

PROJECT LEADER

Salary to £12,330 per annum

A development plan to provide Redbridge with advanced online information systems is in the final stages of agreement. This post offers an opportunity to lead one of the teams engaged in the design and implementation of these systems.

The post is seen as an ideal career move for an ambitious computer professional wishing to develop his/her managerial and technical abilities. The successful candidate will need to demonstrate qualities of initiative, drive, communication and commitment. Length of experience is of lesser importance.

Redbridge is currently expanding its mainframe installation, which is based on an ICL 2958 operating under VME, and developing an extensive communications network. For further details and application form contact Mr. S. Atkins, 22-26 Clements Road, Ilford, Essex IG1 1BD. Telephone: 01-478 3020 Ext: 243.

Closing date: April 2nd, 1984.

LONDON BOROUGH OF REDBRIDGE

(8381)

PUBLIC SECTOR

2 PRINCIPAL LECTURERS

Salary: £12,519-£15,744

7 SENIOR LECTURERS/LECTURERS II

Salary: £7,215-£13,443

2 RESEARCH ASSISTANTS

Salary: £7,215-£11,568

(level of appointment and starting salary dependent upon qualifications and experience. A National salary award is anticipated April 1984)

IN THE
DEPARTMENT OF COMMUNICATION ENGINEERING
AND
DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

Required to join a lively multidisciplinary group involved in:
(i) teaching undergraduates, including those on an MEng programme, and diploma students.
(ii) research and consultancy covering a wide range of activities as detailed by the subject areas given below.
Applicants should hold a first degree in engineering or related discipline; together with relevant industrial, teaching or research experience.

Lectureships in:

Digital Control
Computer Aided Digital LSI/VSLI System Design
Artificial Intelligence in Satellite Communications
Digital Communications
Software Engineering
Systems Design
Computer Vision Systems Engineering
Computer Graphics and Image Processing

Research Assistantships in:

Software Design Tools
Active Tactile Sensors

Application form to be returned by Friday, April 6th, 1984, can be obtained, together with further particulars, from the Personnel Office, Plymouth Polytechnic, Drake Circus PLYMOUTH PL4 8AA. Tel: Plymouth (0752) 264639.

Plymouth Polytechnic

(8336)

SCOTTISH HEALTH SERVICE
COMMON SERVICES AGENCY
Computer Centre

TECHNICAL WRITER

Applications are invited for the above post which is based in the Agency's Computer Centre in Edinburgh.

Candidates for the post should have experience in writing manuals for computer systems and ideally hold a suitable qualification.

The Computer Centre runs an ICL 2966 system under CME and a considerable number of medical, financial and administrative systems are being developed under VME 2900.

Salary scale £7,404 to £9,026 per annum (NHS A & C Scale 4).

Application forms and further particulars can be obtained from the Appointments Section, Common Services Agency, Trinity Park House, South Trinity Road, Edinburgh EH5 3SE. Completed applications should be returned no later than April 5, 1984. Please quote reference number U586/CW.

(8425)

HEREFORD & WORCESTER COUNTY COUNCIL

WORCESTER TECHNICAL COLLEGE

DEPARTMENT OF SCIENCE & MATHEMATICS

LECTURER GRADE I — COMPUTING

Applications are invited from qualified and experienced persons to teach computing in a wide range of courses including GCE 'A' level, the youth Training Scheme, BTEC at Second and National levels for Business Studies and BTEC Certificates in Engineering, Science and Building.

Applicants must possess a degree or equivalent professional qualification.

Salary: Lecturer Grade I (£5,646-£9,735 (Position on scale dependent on qualifications and experience)

Further details and an application form can be obtained from The Principal, Worcester Technical College, Deansway, Worcester WR1 2JF, upon receipt of a stamped, self-addressed envelope. Closing date. (Please quote reference number).

(8432)

SENIOR PROGRAMMER

for University of London computing support

Up to £12,801 inclusive

The computer unit at the Institute of Obstetrics and Gynaecology is involved in mass spectrometry and the study of metabolic diseases. It is well equipped with PDP11s and a variety of microcomputers. One of the PDP11s is used as a remote job entry terminal to the University of London network (Ahmdahl and Cray).

To be considered, you must have a DEC equipment background. A scientific bias would be helpful.

Salary, according to age and experience, in the range £9,378 to £12,801 includes London Weighting.

To apply, please write enclosing c.v. to Dr. C. S. King, Queen Charlotte's Maternity Hospital, Goldhawk Road, London W6 0XG.

(8390)

METROPOLITAN BOROUGH OF Rochdale
An Equal Opportunity Employer

TREASURER'S DEPARTMENT

PROGRAMMERS

(2 posts)

Career Scale 3/SO1 £9,540-£9,990 (starting salary dependent upon experience — bar consists of each grade).

The Authority operates a 2900 mainframe, using online VME 2900 and supporting a large variety of users.

Rochdale is at the forefront of system development in local government with a current comprehensive programme of work, which will undoubtedly increase the responsibilities currently in train.

Experienced applicants are preferred but training will be given to training in ICL 2900 II necessary.

Assistance with removal expenses, etc. and temporary accommodation may be available.

Application forms (available Friday 16/3/84) from Personnel Officer, P.O. Box 39, Municipal Offices, Smith Street, Rochdale OL16 1XU (Tel. 42474, Ext. 6023 to be returned not later than March 30, 1984.

(8394)

UNIVERSITY OF LIVERPOOL
Department of Computer Science

LECTURER

Applications are invited for a post of Lecturer in the Department of Computer Science. Candidates may have research experience in any non-numerical area of Computer Science but applicants with research interests in expert systems, databases or artificial intelligence will be particularly welcome.

Candidates should normally possess a higher degree in Computer Science, or have equivalent industrial or academic experience.

The appointment will commence on 1st May 1984 or a date to be arranged, and will be on the scale £7,190-£14,125 p.a.

Applications, together with the names of three referees should be received not later than 20 March, 1984 by the Registrar, The University, P.O. Box 147, Liverpool, L69 3BX, from whom further particulars may be obtained.
Quote Ref: RV/235/CW

(8219)

CONTRACTS

IBM

SYSTEM 34 RPG II (URGENT)	— LONDON
DOS/VSE, CICS, SNA SYSTEMS PROGRAMMER (END APRIL)	— BERKS
DOS/VSE, COBOL, DL/1 PROGRAMMER	— MIDDX
MVS PL/1 ANALYST/PROGRAMMER	— MIDDX
CULPRIT, IDMS PROGRAMMERS PREF. WITH PL/1	— MIDDX
MVS/JES3 SYSTEMS PROGRAMMERS	— LONDON
DOS/VSE, PL/1, CICS PROGRAMMERS	— LONDON
MVS SYSTEMS PROGRAMMER	— SURREY
DOS/VSE COBOL, DL/1 PROGRAMMER	— LONDON
MVS PL/1 IMS/DC PROGRAMMER	— LANCASHIRE
8100 DPPX COBOL PROGRAMMERS	— LANCASHIRE
3033 MVS COBOL ANALYST/PROGRAMMER	— MIDLANDS
ADABAS, COBOL, CICS SUPPORT PROGRAMMER (SENIOR)	— HERTS

ICL — URGENT

2900 IDMS/TPMS DESIGNER	— LONDON
2900 VME COBOL IDMS/TPMS PROGRAMMERS	— LONDON
2900 VME IDMS/TPMS SYSTEM TESTER WITH COBOL	— LONDON
2900 VME SYSTEMS VALIDATION SPECIALIST WITH SCL	— LONDON
MICRO PASCAL, USE OF X25 PROTOCOL	— BERKSHIRE
ICL SYSTEM 25 DESIGNER/TECHNICIAN	— MIDDLESEX
ICL SYSTEM 25 ANALYST/PROGRAMMERS WITH ASSEMBLER	— MIDDLESEX
ICL 2946 DME RANGE COBOL WITH TPS3 PROGRAMMER	— SUSSEX
ICL 2900, VME, IDMS, TPMS, COBOL	— HERTS

OTHERS

PDP OR VAX PASCAL SOFTWARE PROGRAMMERS	— BERKS
PDP OR VAX COBOL ANALYST/PROGRAMMERS	— MIDDX
PDP, RSX11M, COBOL, MACRO II SNR POSITION	— HANTS
D.G., BUSINESS BASIC PROGRAMMERS	— MIDDX
D.G./DEC FIELD SERVICE BACKGROUND, SOME SOFTWARE	— LONDON
HP SOCIAL SURVEY/STATISTICS ANALYSTS	— LONDON
HP 3000 FORTRAN PROGRAMMER	— YORKSHIRE
HP 3000 COBOL, IMAGE, VIEW PROGRAMMER	— BERKSHIRE
H'WELL L64 IDS2, TDS COBOL ANALYST/PROGS & PROGS	— YORKSHIRE
8086 ASSEMBLER GRAPHICS SPECIALIST/SOFTWARE DEVELOPMENT	— MIDLANDS
8085 REALTIME PROGRAMMERS	— HERTS
M68000 UNIX, C, ANALYST/PROGRAMMER	— SURREY
ATE PROGRAMMERS	— DORSET
SEQUOIA, RPL, ALL DATABASIC ANALYST/PROGRAMMERS	— HERTS

CONTACT LORRAINE, LYNNE, TONY OR WENDY ON 01-948 5922
OR ALTERNATIVELY CONTACT LORRAINE ON WALTON-ON-THAMES 245552
(EVENINGS AND WEEKENDS)

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01-948 5922
KPG Computer Support Services Limited
Cobden House, Park Lane, Richmond, Surrey, TW9 2RA

(8367)

Cambridge Interactive Systems Ltd., is one of the industry's most exciting and fast growing CAD/CAM companies. They are totally committed to a continued programme of research and development in the area of CAD/CAM, particularly 3D Modelling Techniques, Numerically Controlled Machine Tools, Sophisticated Database Techniques and the broadening of applications from Mechanical, Electrical, Civil and Architectural Engineering into other areas of industry. They have in-house, large Prime and Vax Mini-computers dedicated to this development work and these are networked to a number of other Machines within the Organization. A wide variety of Graphics Display Equipment is installed for the development of Graphics Software.

To coincide with the introduction of a new and highly sophisticated range of Software products they have a need to recruit the following high calibre personnel:-

Medusa Product Support Manager
C £16,000

Responsible for the worldwide organization and support of the highly respected Medusa product, the successful candidate's responsibilities will include working closely with the development teams in the co-ordination and definition of product release schedules, liaison with customer field support organizations and the organization of training for field specialists. Additional responsibilities are the co-ordination of product development plans relating to marketing requirements, the organization of appropriate problems reporting and correction procedures and the co-ordination of product testing and documentation.

Development Programmers
to £12,500

Applicants should have a good numerate degree, at least two years experience of programming in a technical environment, together with a good working knowledge of Fortran. Experience of Software development on VAX, Prime or Unix would be valuable as would previous exposure to CAD/CAM Software.

Applications Specialists
£10,000 to £14,000

As part of the Marketing Group candidates will be responsible for promoting and exploiting Medusa in specific industry areas. The Applications Specialists will investigate market requirements in particular areas, specify enhancements to the system required by that market, liaise with the sales organizations and organize the production of special industry specific sales material, demonstration material and customization of Medusa.

Product Development Engineers
to £12,000

As a Member of the Product Support Team you will be working closely with the Software Development Teams on the development, evaluation and testing of new CAD/CAM products. The post will include training field support staff in the use of new products together with developing appropriate user interface material such as menus, demonstration material and on-line instructional aids. Applicants should have at least two years experience of practical engineering preferably in a Drawing Office, Mechanical Design or NC environment together with some experience of working with Technical Software.

Technical Authors
£10,000 to £14,000

Developing the technical documentation, training material and other support aids for CIS's wide range of CAD/CAM products. Candidates will be working closely alongside the efforts of the Software Development Teams. You will have a fairly deep understanding of both the Software being documented as well as the Drawing Office environment in which it will be used. Consideration will be given both to applicants who have previous documentation experience as well as those who have substantial experience in Engineering, Software Development or Field Support of CAD/CAM Systems.

For all of the above positions it is envisaged that applicants will be educated to either HND or Degree level, have substantial practical experience in a specific industry area such as Civil Engineering, Plant Design, Architectural, or Electrical Engineering together with a knowledge of current CAD/CAM technology. In addition to the excellent salaries and bonus offered, these positions represent unique opportunities to join a Company whose success to date far outstrips any of its nearest rivals.

CIS
Medusa

Please contact: David Hendry, CADsearch, London House, 271-273 King Street, London W6 9LZ. Telephone: 01-741 8011 (eves 01-748 1987/1975/2160) or home no: 0784 52312.

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Location – Bristol

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We are one of the leading systems houses in the West Country, involved in supplying bespoke software on a project or turnkey basis to local companies.
We have an impressive reputation, excellent capital funding and a sound development base from which to launch our future growth.

The Requirement

Due to the continuing expansion of our business we are eager to recruit an additional sales executive who will be closely involved with our management team in meeting the targets for expansion that we have set for the next 5 years.
We consider it to be essential that prospective candidates should be able to demonstrate a successful track record and a thorough understanding of selling business solutions within the computer industry. They should be self motivated business men or women with an innate understanding of how to manage and meet individual and corporate goals.

The Job

Together with senior management, the successful candidate will be involved in developing our current sales strategy by building on the foundations of previous successes and initiating the contacts and procedures necessary for new business sales. The candidate will be able to draw on internal resources for all necessary support and guidance when presenting solutions to potential clients.

Location

We are based in Central Bristol close to Temple Meads Station with convenient car parking nearby.

For Further Details

Please contact our Branch Manager, Peter Johnston on 0272-215286 (office hours) or Malmesbury (0666) 840787 (evenings & weekends). He will be pleased to discuss this position further and to arrange for you to receive some background information about our company.

TOTAL SYSTEMS (Western) LIMITED
33–49 Victoria Street, Bristol BS1 6AD

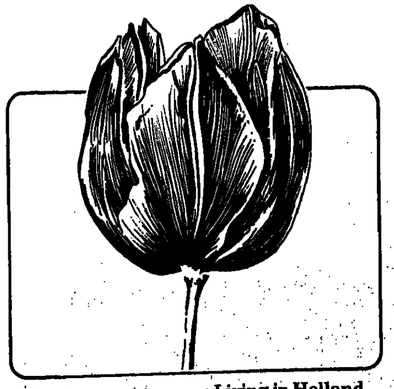
0272 215286

Project Leader

Negotiable Salary

This position has arisen due to the increasing demands on the time of the Project Development Manager and the person selected will deputise for him in his absence. Candidates should have about 7 years' strong IBM experience and have been responsible for at least one major project. A good commercial background is essential and knowledge of library systems would be an advantage. Exposure to IDMS and Shadow II would be an asset.

HOLLAND



Analyst/ Programmer
Library Systems
£11—£17,000

This opening offers the opportunity to become involved in important development work with strong emphasis on analysis. The ideal candidate should have between 3 and 5 years' analysis and programming experience, preferably in a DEC environment, although IBM would be acceptable. A good knowledge of COBOL is required together with a strong technical background. Experience of library systems is essential.

IBM and DEC Installation
The organisation utilises large IBM hardware and multiple DEC computers and several on-line database systems are operational. In addition, a network with distributed databases at its offices in North and South America and Europe is being set up. COBOL is the main programming language.

Working Environment
The development team comprises a number of experienced analyst programmers who work individually on projects or combine into small project teams as the need arises. A high proportion of the staff is British and English is the working language of the installation.

Living in Holland
Many British computer staff work in Holland and it is in many ways the "softest landing" for those who wish to move to continental Europe. The client is located in a small town near the coast and accommodation in the area is not difficult to find.

Relocation
A generous relocation package is offered to help candidates and their families settle in satisfactorily.
English, as well as being the working language of the installation, is generally spoken throughout Holland, which considerably eases settling-in problems.

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(0270) 627 206

Interviews
Initial interviews with the client's representatives will be held in the UK during April.

For an initial discussion, ring me, Alison Jary, on (0270) 627206 office hours or (0270) 625436 other times, or write to me at the address opposite.

Contractors – What Will It Be?

£----

No – we are not aiming for a mass rates explosion but our clients are in need of freelance programming and analytical support and the remuneration is very attractive.

Naturally, we would be more than interested to hear from any contractor who is now or shortly to be available but in particular our requirements are as follows:

Programmers with PL/1, IMS DB/DC and JSP experience

+

Programmers with NCR mini/mainframe, IMOS/IRX/VRX and COBOL experience

+

Programmers with Univac OS1100, DMS, TIP and COBOL experience

+

Analysts and analyst/programmers with banking/financial systems experience, preferably gained in an IBM mainframe environment.

Our clients are predominantly large organisations in the banking and insurance sectors who have extensive development plans and who offer excellent working conditions.

Please send your CV or telephone Barrie Frost

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Senior staff must be self-reliant, consultancy orientated and be capable of high levels of interaction with the sales team to develop new business.

We also welcome applications from Systems and Software Engineers with a minimum of three years' relevant industrial experience:–

PDP/VAX	GEC 4000		
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Assembler	Coral 'C'	ADA	Pascal
PLM			

Mini and Micro experience not covered above may still be relevant.

All candidates must be mobile, committed and willing to work at client sites within commuting distance of Staines. Some opportunities for work also exist on the Hampshire coast. Whilst the candidates should preferably live in the A3/M3/M4/M25 belt, relocation packages will be considered at all levels.

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Alternatively phone Geoff Dongworth at home on Hackwood (025879) 6307 or write to him at Cord Designs Limited, Cord House, The Causeway, Staines, Middlesex TW18 3AX.

(8044)

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Our client is a well-established name in both minicomputer-based turnkey systems and computer terminals and have secured some 25% of their specialist market. Such is the success, that all of their existing salespeople consistently achieve target. This is most likely due to the company's unusually high investment in advertising.

We are seeking three accomplished salespeople; one with significant experience of selling DEC-based commercial and industrial **Turnkey Systems** up to a value of say £200k, and two with a good track-record of selling **Computer Terminals.** In the former case, a pre-sales support analyst would also be considered. In the latter case, some exposure to DEC equipment will be advantageous, but not imperative, whereas a proven ability to communicate at a senior level is essential in both instances.

An attractive compensation package is negotiable, including a company car and a variety of fringe benefits with on target earnings of £22,000.

Please contact Lindsay Howle (London) or Roger Dodd (Midlands), quoting reference HSC/024.

(8328)

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As an experienced analyst/programmer you will control the day to day running of the department with three personnel reporting to you. Responsibilities will include maintaining and developing existing programs and developing new systems for both short and long term requirements. As a professional you will be contributing to future growth and success. As a member of a team playing an important role within the company.

You will need to be self-motivated and able to work without supervision. Good communication skills are essential with the ability to be diplomatic with users at all levels. **Every opportunity will be given to develop your technical ability with training courses.**

For further information please call **Richard Milsum** on **01-354 1055** during office hours or on **01-958 2853** in the evenings or weekends. Alternatively please send full details to:

(8370)

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Reporting to the Systems and Programming Manager, the job holder's duties will cover all aspects of systems development from user requirements specification to implementation. The working environment is a pleasant, well equipped open plan office.

The successful applicant will have had at least four years' systems experience preferably gained in a large industrial organisation. DEC experience (PDP, RSTS, DIBOL) would be a distinct advantage, as would knowledge of structured methodologies. He/she will be well educated, preferably to degree level.

Benefits include pension, ill-health and life assurance schemes, basic 35-hour week and generous holidays. Relocation will be paid where appropriate.

Write or telephone for an application form, quoting reference 16/84, to:

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(8270)

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SALES BIT

Installing a system is no small business for optimism

AS one who has sold a lot of business systems in his time, involving a variety of solutions from the installation of mainframe computers to the use of service bureau facilities, recently I have sustained the cultural shock of installing a microcomputer-based system for controlling company accounts.

What a revelation it has been, not only in terms of our own accounting procedures, but also in the realisation of the potential problems for small businesses which today are installing such systems without the benefit of understanding computers, appreciating systems design and, in many cases, having no full-time accountant to sort out the errors and exceptions that inevitably come to the surface when a computer is put into effect.

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The scope and power of the computer, for the greater proportion of the population, is now a well-established component of every day mythology. It is the ultimate panacea; a cure-all for even the blackest business malady.

One probably has to be an established user or supplier before really appreciating the fallibility and limitations of the computer as an electronic saviour. However, there are still salesmen in our midst who see the small business computer in particular with rose-tinted optimism.

One of the biggest dangers for the first-time user of, say, a microcomputer-based system for commercial accounting, is the implied suggestion that a person who is fluent with the facilities and mechanism of a commercial accounting system must also be completely aware of accounting practice and have immediate understanding of the existing accounting produce that is being converted to computer processing.

This is not necessarily – or even often – the case. A post-sales support analyst should be able to advise the end-user on how the data should be prepared and entered into the system, advise on data processing disciplines, and show the user how to use the various facilities available. But he/she will the advisor be able to offset that data processing truism that garbage in equals garbage out.

After all, the analyst's job is to ensure that the system is processing that data presented to it in the prescribed manner.

It is not his job to qualify the balances brought forward from past financial years, question the analysis of purchase invoices, quantify the effects of previous mis-postings, query the matching of payments with ledger items, and so on. He asks the end-user for the facts, and unless something is obviously amiss, assumes them to be correct.

Even if he had a good basic instinct for figures, it is unlikely to be of any significant value unless he has had prolonged exposure to the client's accounting procedure. And few, if any, turnkey systems houses have time for such non-chargeable niceties.

It felt rather odd having to make a decision about which computer system I should install. As a salesman with a good inside knowledge of the business, a fairly comprehensive knowledge of the kit and software available, over 20 years' experience of commercial data processing and business management and, through sales and technical staff recruitment for the supplier sector, in regular contact with a host of companies with the resources to solve any problem, it was obviously much easier for me than the maiden user to get to know what was possible and select the most appropriate short-list of suppliers.

Not a bit of it! The more alternatives I considered, the more they looked the same.

There were so many possibilities and permutations that their interaction served only to confuse.

I found myself in a "Gordian Knot" situation where the only way to untangle my deliberations was to cut it straight through the middle with a piece of pragmatic logic.

Having operated a manual accounting system for over eight years, I figured there were bound to be some problems with mis-postings, wrong analysis, compensating errors and the like, and the computer was bound to bring a few "nasties" to the surface.

So, I figured I didn't so much need an analyst/programmer as an accountant to handle the challenge of dragging us into the world of electronic data processing.

I made a few enquiries in the locality of our Lichfield office to see if any of the local turnkey outfits employed qualified accountants as well as computer technicians. I soon discovered that this was not a common phenomenon.

But I eventually made contact with Robert Jones of Peach Data in Burton-on-Trent, himself a chartered accountant, and asked him over for a discussion on what his company could do for us.

He was soon able to identify areas of improvement in our procedures and report and pinpoint some of the eccentricities of previous book-keepers. We ironed out each problem as it arose and it was not long before the first profit and loss account was proudly presented to me.

The conditioning of a deprived youth coupled with the discipline of many years service with American corporations made me instinctively look at the figure in the bottom right-hand corner.

I knew instinctively that it was completely wrong!

Alan Williams

PUZZLE ANSWER

THE square of $(n+1)$ is always $(2n+1)$ greater than n^2. So $1,985^2$ must be: $1,936,256+(2\times1,984)+1$ $=3,940,225$.